

Natural language variables

Variable-based semantic theories of pronouns and proper names

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Abstract

Semanticists, philosophers and logicians have standardly analyzed a range of natural language expressions on the model of the variables of formal languages. This dissertation explores variable-based semantic theories of *pronouns* and *proper names*.

The first two chapters argue that a variable-based, presuppositional semantics for pronouns proposed by Cooper (1979, 1983) resolves an apparent trilemma arising from the conjunction of three plausible commitments concerning the semantics of pronouns: that some anaphoric pronouns with quantifier antecedents are bound variables, that referential pronouns have context-independent meanings, and that the relation between bound and referential pronouns is not *ambiguity* or *homonymy*.

The first chapter argues that Cooper's semantics is descriptively and empirically superior to alternative theories, including Kaplan's (1989a/b) account, which does not resolve the trilemma. The second addresses an important objection to the view that bound and referential pronouns make the same semantic contribution, involving cases where bound pronouns do not appear to trigger semantic presuppositions. I argue that this appearance is misleading: bound pronouns *do* trigger semantic presuppositions and have the same (Cooper-style) denotations as referential pronouns.

The third chapter addresses the phenomenon of *non c-command* or 'donkey' anaphora. These anaphors appear to require a departure from Cooper's semantics and, more generally, from the view that anaphoric pronouns correspond to (classical) bound variables. I consider D-type accounts of donkey anaphora and argue that these accounts must be revised in ways that bring the denotations of donkey anaphors closer to those of ordinary bound and referential pronouns.

The last chapter asks whether proper names require a variable-based semantics. I consider a pair of recent anaphoric theories of proper names (Fine 2007; Cumming 2007, 2008), according to which proper names have anaphoric uses and are thus better modeled as variables. I argue that there are important reasons to *reject* a variable-based model for proper names, in contrast with pronouns.

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1 Introduction

Semanticists, philosophers and logicians have standardly analyzed a range of natural language expressions on the model of variables of formal languages. In particular, while it is controversial whether natural languages contain variables over higher-type items like properties, relations or generalized quantifiers, a common view is that they *do* contain variables or variable-like items which designate or range over *individuals*. This dissertation asks, in particular, whether English-language *pronouns* and *proper names* correspond to formal language individual variables.

1.1 Pronouns as variables:

1.1.1 Anaphoric and referential pronouns as variables

The view that natural language pronouns correspond to formal language variables dates back at least to the late medieval times, to supposition theorists such as Paul of Venice, Soto and Celaya, who analyzed pronouns in quantificational sentences as variables (Parsons 1994). Geach's (1962) criticism of supposition theory retains and broadens this view (see also Quine 1969).¹ According to Geach, the relation between an anaphoric pronoun and its antecedent, whether quantificational or not, "*strictly* corresponds" to the relation between bound variables and their binders.²

¹ Of course, there is also the discussion of the relation between natural language pronouns and logical variables of Frege's *Grundgesetze der Arithmetik* (Vol II, pp. 79-80).

²Geach does countenance one exception to the view that "it is all one whether we consider bound variables or pronouns of the vernacular": *pronouns of laziness* (1962, 112). Evans (1977a, 467) describes Geach's pronouns of laziness as ones "which go proxy for expressions which the speaker does not wish to repeat". For example, pronouns like 'it' and 'one' in (a), according to Geach, are respectively proxy for 'a donkey' and 'the man'.

(a) A man who sometimes feeds his donkey has more sense than one who never feeds it.

As we will see in Chapter 4, Evans takes issue with the claim that pronouns of laziness are exceptional, maintaining (along with the majority of contemporary authors) that there are a variety of pronoun uses that do not conform to the classical model of the variable.

It is very important to notice that the relation of bound variables to the binding operator in symbolism *strictly* corresponds to the relation of pronoun to antecedent in the vernacular. (Geach 1972, 12-13)

On the anaphoric interpretation of a sentence like (1), the pronoun in the main clause is taken to correspond to a variable, like 'x' in (1'), and both sentences are true just in case a certain set of men is a subset of the set of self's-mother-lovers.

(1) Every man loves his mother.

(1') Every man $\lambda x[x$ loves x's mother]

What, then, is the relation between the *anaphoric* use of the pronoun 'his', just indicated, and its *referential* use, where 'his' refers to a salient man m , and (1) is true just in case every man loves the mother of m ? As Perry (1997) observes, it is not plausible that the two uses are unrelated – or that the relation is mere *homonymy*.

No one supposes that [referential and bound pronouns] are mere homonyms. Many philosophers are at least tempted to suppose they are occurrences of a single ambiguous word, which sometimes functions as a variable and sometimes as an indexical. The challenge for semanticists is to describe the linguistic meaning of 'she' in a way compatible with its various uses. (1997, 594)

One natural way to extend the model of the variable to referential pronouns is to treat referential pronouns as *free* variables (Lasnik 1976, Evan 1980). As Salmon (2006) observes, if bound pronouns correspond to bound variables, referential pronouns “surely must correspond in some respects to free variables under an assigned value” (Salmon 2006, 656). In places, Kaplan (1989a/b) also expresses sympathy for this view:

The difference between demonstrative and anaphoric uses of pronouns can... be seen in terms of the syntactical distinction between free and bound occurrences of terms. (1989b, 572)

On this proposal, there is a neat correspondence between pronouns and variables: bound pronouns correspond to bound variables that range over a universe of values and do not designate, while referential pronouns correspond free variables that designate some particular object (or set or sum of objects) under an assignment of value.

One reason that this view is attractive is that there appear to be important ways that referential pronouns are like free variables. According to Kaplan, both kinds of term are 'paradigms

of direct reference'. To say that a variable x is directly referential is to say that its propositional contribution relative to an assignment g is the object $g(x)$ that g assigns x from the universe of values over which x ranges – but nothing more.¹

In determining the semantic value for a formula containing a free variable we are given a *value* for the variable – an individual drawn from the universe over which the variable is taken to range – but nothing more. (Kaplan 1989a, 484)

If free variables relative to assignments are “paradigms of ... directly referential terms” in *formal* language, Kaplan argues, referential pronouns are paradigms of directly referential terms in *natural* language (1989b, 537). According to Kaplan, the component of the proposition corresponding to the pronoun ‘you’ in (2), which is not controlled by a variable binding operator, is the referent (contextually) assigned to the pronoun and nothing more than this.

(2) You are in danger.

On this view, sentences like (2) – like formulas containing free variables – semantically express *singular propositions* (relative to appropriate assignments of value).

If the component of the proposition (or the step in the construction of the proposition) which corresponds to the singular term is determined by the individual and the individual is directly determined by the singular term—rather than the individual being determined by the component of the proposition, which is directly determined by the singular term—then we have what I call a singular proposition. (ibid)

For both kinds of terms (pronouns and free variables), the component of the proposition corresponding to the value of the term is an individual referent “directly determined by the singular term” – rather than being determined by some mediating component of the proposition (e.g. an individual concept or set of properties).

1.1.2 Two problems: referential pronouns and donkey anaphora

Despite the aforementioned analogies, Kaplan argues that referential pronouns do *not* correspond to

¹ In non-Russellian terms, to say that a variable x directly refers to an object is to say that its value is a constant function from world-time pairs $\langle w, t \rangle$ to that object.

individual variables. According to Kaplan (1989b, 592), referential pronouns are analogous to free variables only in the attenuated sense that “both are parametric, their content varies as the parameter varies”. He stresses that the formal analogy between free variables and referential pronouns “should not cause us to lose sight of the fundamental difference between free variables and indexicals”, namely:

Indexicals are real, meaning-bearing elements of language. Free variables are not; they are artifacts of our formalism. (1989b, 593)

Free variables are “artifacts of our formalism”, according to Kaplan, in the sense that the “first and only meaning” of a variable is its value – its contribution to the propositional expressed by an open formula, relative to an assignment of value (Kaplan 1989a, 484).¹ By contrast, pronouns like ‘you’ in (2) are ‘real meaning-bearing elements of language’ in the sense that their semantic values are *not* exhausted by their references (their propositional contributions).

In the semantics that Kaplan presents in “Demonstratives” (1989a) and “Afterthoughts” (1989b), these additional semantic values of pronouns are identified with *characters*. Whereas contents (the analogue of a variable’s value under an assignment) are ordinary intensions, functions from circumstances of evaluation to appropriate extensions, characters are *functions from contexts to contents*. The character of ‘you’ in (2), for example, is a function which maps an arbitrary context c to a_c , the addressee of the speaker in c , while the character of ‘I’ is a function which maps an arbitrary context c to s_c , the speaker in c .

[[I]] ^{c, g, i} = the speaker of c

[[you]] ^{c, g, i} = the addressee of c

(Here ‘ c ’ represents the context of interpretation, ‘ g ’ represents a variable assignment function, and ‘ i ’ represents the circumstance or index, which supplies the parameters relative to which an interpreted sentence is evaluated for truth or falsity.)

¹ Another central differences between referential pronouns and free variables that Kaplan mentions concerns the ‘origin of their values’ (Kaplan 1989b, 591). While free pronouns and free variables are both ‘parametric’, variables have values relative to parameters that are “stipulative; they have no fact of the matter parameter” (ibid). By contrast, each parameter of the assignment function that assigns values to pronouns “has an interpretation as a natural feature of a certain region of the world” (Kaplan’s ‘context of use’) (ibid).

Kaplan's decision to associate referential pronouns with characters has important consequences both for the view that pronouns can (uniformly) be identified with variables (free or bound) and also for the view that pronouns form a unified semantic category of term. In order for bound pronouns to be associated with characters, the operators and quantifiers responsible for binding pronouns would have to operate or quantify over contexts (the inputs to characters). However, there are a variety of compelling reasons to think that ordinary operators and quantifiers do not operate on or quantify over contexts. One reason, as Kaplan himself observes, is that if there *were* such operators, we would expect them to operate on the parameters that notoriously unshiftable pure indexical pronouns like 'I' and 'you' depend on.

Are there such operators as 'In some contexts, it is true that φ ', which when prefixed to a sentence yields a truth if and only if in some context the contained sentence (not the content expressed by it) expresses a content that is true in the circumstance of that context? (1989a, 510).

Kaplan argues that there are not. For example, there is no interpretation of (3) where the sentence is true at the present context just in case the embedded sentence is true at *some* context or another.

(3) In some contexts it is true that I am not tired now.

The only reading of (3) is one on which the indexicals take wide scope with respect to the attempted operator on contexts.

If there are no operators on context – no operators that 'bind into character' – then bound pronouns cannot be associated with the character-level contents that distinguish referential pronouns from free variables. As a consequence, bound and referential pronouns *are*, effectively, treated as homonyms in Kaplan's semantics. The meaning of the *referentially* used pronoun in (1) (simplifying somewhat)² is identified with a function that maps an utterance context c to a salient man in c . By contrast, on its bound use, the pronoun is identified with a variable, and its "first and only" meaning is its alternate values under varying assignments.

We appear then to be left with something of a trilemma. On the one hand, as we will see in

² As we will later see in Chapter 2, Kaplan treats pronouns like 'he' (true demonstratives) as indexicals that originate with incomplete characters. Thus, 'he' refers to a salient man in relative to the utterance context c only once its character is completed in context by an associated demonstration or other indication of the speaker's referential intentions.

Chapter 2, it is plausible that referential pronouns *do* have context-independent semantic values – that their semantic contributions are not exhausted by their references relative to a context. On the other, pronouns have bound uses, which seem appropriately captured by modeling them on variables. At the same time, it is also plausible that there *is* a close relation between the semantics of bound and referential pronouns – that the two kinds of pronoun occurrence are not related by ambiguity or homonymy.

A second difficulty for the view that pronouns correspond to variables involves a certain class of *anaphoric* pronouns. According to Geach, “the relation of bound variables to the binding operator in symbolism *strictly* corresponds to the relation of pronoun to antecedent in the vernacular” (1972, 12-13). The difficulty with this view is that some anaphoric pronouns fall outside the syntactic scope of their antecedents. A well-rehearsed example is (4):

(4) Every farmer who owns a donkey feeds it.

Leaving the details to chapter four, there is good reason to think that the pronoun ‘it’ does not fall in the syntactic scope of the indefinite ‘a donkey’. Nevertheless, (4) has a covarying reading expressible in first order logic as (5), which requires that the pronoun range over the various donkeys owned by the relevant set of farmers.

(5) $\forall x \forall y ((\text{farmer}(x) \wedge \text{donkey}(y) \wedge \text{owns}(x, y)) \rightarrow \text{feeds}(x, y))$

Since donkey anaphors like ‘it’ in (4) occur outside the syntactic scopes of their antecedents, it seems that they cannot (given standard assumptions) semantically correspond to the *bound* variables of classical logic. At the same time, since they are *anaphors*, they cannot be modeled as *free* variables either. Consequently, in addition to the difficulties with referential pronouns, there appear to be some *anaphoric* pronouns that do not (*pave* Geach) conform to the classical model of the variable.

1.2 Proper names as variables: Some analogies and disanalogies

If the main problem with the view that pronouns correspond to variables arises in the *referential* case, the main problem with the view that *proper names* correspond to variables arises in the *bound* case. On

the one hand, there are some important properties that proper names and *free* variables appear to have in common. Proper names are *also* – along with referential pronouns and free variables – said to be paradigms of direct reference. Powerful arguments in Kripke (1972) have convinced many philosophers and some semanticists that proper names refer directly – that the component of the proposition corresponding to the contribution of a proper name, like a pronoun, is an individual directly determined by the name, rather than by a mediating Fregean *Sinn* or content of some other kind (individual concept, set of properties ...). Indeed, proper names are in one respect *more* similar to (free) variables than referential pronouns are, on this view, since names and variables have just one kind of semantic value, while referential pronouns seem to have *two* kinds of semantic value. The values of proper names (their propositional contributions) are exhausted by the objects they refer to in the way that a variable's "first and only" contribution to the proposition expressed by an open formula is its value (relative to an assignment).

Nevertheless, proper names are *not* traditionally modeled on variables for the reason noted above: that proper names do not seem to have *bound* occurrences as variables and pronouns do. Despite occurring in an argument position controlled by the quantifier, the proper name in (6) cannot be bound so that it ranges over some non-singleton set of winners each of whom is named 'John', generating a reading on which (6) is true just in case every winner congratulated himself.

(6) Every winner congratulated John.

Thus, the disanalogy between proper names and variables appears to be greatest in the *bound* case (variables have a *bound* use that proper names appear to lack).

The more general problem with the analogy between proper names and individual variables is that proper names do not seem to be *parametric* in the way that individual variables are. The references of proper names do not vary with the values of parameters in the way that the values of free variables vary under different assignments. Of course, when a name is used in conversation or text, one can ask who or what the name refers to; one may not know *which* man called 'Aristotle' is spoken of when someone says, "Aristotle was wise". With proper names, however, it is generally

supposed that we have *ambiguity*, rather than any kind of parameter-dependence (e.g. indexicality). But if the values of proper names do not vary *either* with the values of quantifiers or other variable-binding operators *or* as a function of parameters set by an occasion or context of use, then it is not clear in what sense names are properly said to exhibit *variable*-like behavior. In view of their parameter independence, proper names seem – and are widely held to be – more like *individual constants*, which are assigned reference once and for all when the model for the language is specified, rather than by elements of the language itself.

1.3 Summary and overview of chapters

On the pair of traditional views concerning the semantics of names and pronouns just sketched, neither pronouns nor proper names can be uniformly identified with variables. The problems for the view that pronouns correspond to variables include donkey anaphora and disanalogies between referential pronouns and free variables, while the main problem for the view that proper names correspond to variables is that names do not appear to be bindable, or – more generally – to depend on parameters, including those that might be controlled by operators. In this dissertation, I argue that one of these problems is real, one is merely apparent, and the status of the third is uncertain. In particular, the model of the variable *can* and *ought* to be extended to referential pronouns – but not to proper names. In the case of donkey anaphors, the jury is out.

Chapters 2 and 3 defend an alternative semantics for pronouns developed in Cooper (1979, 1983). On Cooper's semantics, all pronouns contribute individual variables, which can left free or bound by a variable-binding operator. Kaplan's characters are replaced by semantic presuppositions, which are associated with bound and referential pronouns alike. These presuppositions are triggered by the phi-features of pronouns (gender, number and person), and restrict contextual or quantificational assignments to the variables in their logical forms. An important advantage of Cooper's analysis is that it provides a way of resolving the trilemma for semantic theories of pronouns observed in §1.1, by reconciling the bound uses of pronouns with the context-independent (more broadly, assignment-

independent) semantic values of pronouns.

Chapter 2 provides a preliminary defense of Cooper's semantics, arguing that pronouns are associated with semantic presuppositions of the kind Cooper proposes.³ I examine objections to the semantic presuppositions analysis of phi-features, according to which phi-features contribute contents with properties that distinguish them from standard presupposition triggers. In each case, I argue that the property in question is either compatible with a presuppositional analysis or that phi-features do not genuinely have the property in question.

Chapter 3 addresses an important objection to the view that bound pronouns make the same semantic contribution as referential pronouns. This objection involves a class of cases that purportedly show that the values of bound pronouns *are* exhausted by their alternate assignments of value. I argue that these cases are not compelling, and that bound pronouns are associated with semantic presuppositions just as referential pronouns are. Consequently, bound and referential pronouns require a unified semantics of the kind that Cooper proposes.

Chapter 4 addresses the phenomenon of non c-command or 'donkey' anaphora. I consider D-type accounts of donkey anaphora and argue that they must be revised in ways that bring the denotations

³ I will focus exclusively on the semantic role of phi-features on pronouns, setting aside questions about the role of phi-features on non-pronominal items (verbs, adjectives, noun phrases, and the like). Many authors maintain that non-pronominal phi-features are selected on purely syntactic grounds and serve as markers of grammatical agreement, rather than playing any semantic role, presuppositional or otherwise. For critical discussion of this view, see Rullmann (2003, 2004). (Some authors also maintain that features on *anaphoric* pronouns are present solely for purposes of agreement. This question is the topic of Chapter 3.)

An important disclaimer is that this discussion exclusively concerns the interpretation and behavior of *English* language pronouns. Different languages employ different pronominal systems. For example, Kriol has a pronominal system that distinguishes singular, dual and plural pronouns, as well as first person plural and inclusive and exclusive (Lefebvre 2011). Bengali has a complex pronominal system that includes twenty-four different pronominal forms, but does not encode gender (Bhattacharya et al 2005). Apart from differences in pronoun inventories, there are important differences in the way in which pronouns relate to contexts across languages – in particular, there are differences in the ways in which pronouns interact with various kind of operators. Recent work in a variety of languages (e.g., Navajo (Speas 1999), and Amharic (Schlenker 2003a/b)) suggests that some natural languages contain indexical pronouns that can be shifted by certain operators in ways that are unattested in English (see Anand 2006). The claims made in this chapter about the behavior of pronouns (especially those concerning differences in the scope-taking possibilities of 1st and 2nd versus 3rd person pronouns) should be interpreted narrowly, as concerning the English pronominal system.

Finally, for reasons of space, I discuss *personal* pronouns exclusively. I will not have anything to say about temporal or locative pronouns ('here', 'today' and, on some analyses, markers of tense), and little to say about true demonstratives such as 'this' and 'that'.

of donkey anaphors closer to those of ordinary bound and referential pronouns. In particular, building on the theory of Elbourne (2001a/b, 2005), I argue that the mechanisms that appear to be needed to derive donkey anaphoric readings in *bishop sentences* can – and arguably must – be applied to ordinary donkey sentences. Furthermore, building on an objection in Evans (1977a) concerning scope readings of sentences containing donkey anaphors and D-type descriptions, I argue that the model of *definite descriptions* for donkey anaphora cannot be retained. This pair of objections appears to show that an adequate D-type semantic theory of donkey anaphors must look rather different from standard D-type analyses – in particular, the denotations of donkey anaphors must be more similar to those of bound and referential pronouns and thus closer to those familiar from dynamic theories. At the same time, various, more complex bishop sentence cases appear to show that what is needed is a radically revised D-type theory, rather than a dynamic account.

Chapter 5 asks whether the model of the variable can be extended to proper names. I consider a pair of anaphoric theories of proper names (Fine 2007; Cumming 2007, 2008), on which names function like anaphors, and are better conceived of as variables rather than constant terms. According to the proponents of these views, proper names *do* interact in semantically significant ways with operators; in particular, names have bound occurrences that are difficult to explain on an individual constants model, but fall out naturally from an anaphoric semantics. These views are also held to explain the phenomenon of substitution failure, whereby co-referential proper names make different contributions to the informational or semantic contents of sentences. I argue that the approach anaphoric theories take to substitution failure is flawed, as is the evidence that proper names interact with operators. While pronouns *do* correspond to natural language variables, proper names do not.

2 Referential Pronouns as Semantic Presupposition Triggers

2.0 Introduction

There is a long tradition of philosophers, logicians and semanticists taking pronouns to *be* variables – or, more cautiously, to play the role in natural languages that variables play in formal languages. Geach (1962, 112) writes, “for a philosophical theory of reference, then, it is all one whether we consider bound variables or pronouns of the vernacular”; elsewhere, that the relation between anaphoric pronouns and their antecedents “*strictly* corresponds” to the relation between bound variables and their binders:

It is very important to notice that the relation of bound variables to the binding operator in symbolism *strictly* corresponds to the relation of pronoun to antecedent in the vernacular. (1972, 12-13)

One compelling reason to associate pronouns with variables is that pronouns seem to have *bound* uses. For example, (1) has a natural quantificational reading, formally regimented by mapping the pronoun ‘him’ to the bound variable ‘x’ in (1’), on which (1), like (1’), is true just in case a certain set of men is a subset of the set of self’s-mother-lovers.

(1) Every man loves his mother.

(1’) Every man $\lambda x[x$ loves x’s mother]

What, then, is the relation between the bound use of the pronoun ‘his’ in (1) and its *referential* use, where the pronoun is *not* controlled by a variable-binding operator? On the referential reading, the pronoun refers in the utterance context c to some salient man m in c rather than ranging over a set of men, and (1) is true just in case every man loves the mother of m . As Perry (1997) observes, it is not plausible that the two uses are unrelated – or that the relation is mere *homonymy*.

No one supposes that [referential and bound pronouns] are mere homonyms. Many philosophers are at least tempted to suppose they are occurrences of a single ambiguous word, which sometimes functions as a variable and sometimes as an indexical. The challenge for semanticists is to describe the linguistic meaning of ‘she’ in a way compatible with its various uses. (1997, 594)

A natural view is that referential pronouns correspond to *free* variables that designate some particular object (or set or sum of objects) under an assignment of value (while bound pronouns correspond to bound variables ranging over a universe of values). Kaplan (1989b, 572) initially expresses sympathy for this view:

The difference between demonstrative and anaphoric uses of pronouns can... be seen in terms of the syntactical distinction between free and bound occurrences of terms.

As we saw in §1.1, however, Kaplan ultimately rejects the view that referential pronouns can be identified with free variables (Braun 2010). In the semantics Kaplan presents in *Demonstratives* (1989a) and the *Afterthoughts* (1989b), Kaplan identifies the context-independent meanings of referential pronoun with *characters*, functions from contexts to contents. Since the operators and quantifiers responsible for binding pronouns do not operate or quantify over contexts (the input to characters), bound pronouns *cannot* be associated with the character-level contents that distinguish referential pronouns from free variables. As a consequence, bound and referential pronouns are effectively treated as homonyms: the meanings of referential pronouns are identified with characters, functions from contexts to contents, while bound pronouns correspond to bound variables, their semantic values exhausted by their varying assignments of value.

In this chapter, I defend an alternative to Kaplan’s semantics for pronouns due to Cooper (1979, 1983). In contrast with Kaplan, Cooper does *not* back away from identifying referential pronouns with free variables. According to Cooper, pronouns – bound and referential alike – contribute individual variables, which may be either bound by an operator or left free and assigned a value in context. The assignment-independent semantic values of pronouns correspond to semantic presuppositions, triggered by pronominal features of gender, number and person. These features restrict assignments to the variables in the logical forms of pronouns – whether those variables are free or bound. Thus, an important advantage of Cooper’s semantics is that it resolves the apparent

trilemma that Kaplan’s account leaves us with, reconciling the assignment-independent semantic values of pronouns with their bound use, thereby making good on the conviction that bound and referential pronouns are not mere homonyms.

The argument for Cooper’s semantics is distributed over this chapter and the next. In the present chapter, I provide a preliminary defense of Cooper’s semantics, arguing that pronouns are associated with semantic presuppositions of the kind Cooper proposes. In §2.1, I sketch an updated version of Cooper’s analysis due to Heim and Kratzer (1998). In §2.2-2.3, I introduce the notion of semantic presupposition and standard projection tests for presuppositions, and I show that these tests support Cooper’s analysis. In §2.4, I examine objections to the semantic presuppositions analysis of phi-features, according to which phi-features contribute contents with properties that distinguish them from standard presupposition triggers, and instead suggest alternative analyses – in terms of extra-semantic (pre- or post-semantic) contents, or semantic but non-presuppositional contents like conventional implicatures. In each case, I argue that the property said to be at odds with Cooper’s presuppositional analysis is, on closer inspection, compatible with Cooper’s account, or that phi-features do not genuinely have the property in question. An observation that plays an important role in these arguments is that phi-features do not contribute contents that are *scopally inert*. This observation, further reinforced by the arguments in Chapter 3, is strong evidence against the alternative analyses of features considered in §2.4, and strong evidence for a Cooper-style presuppositional analysis.

2.1 Cooper’s presuppositional semantics for pronouns

2.1.1 Cooper’s proposal

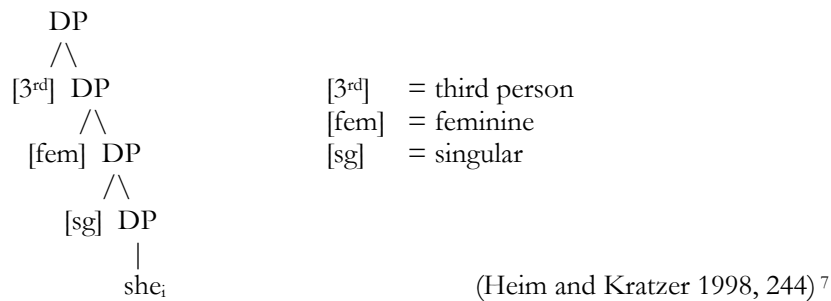
Given the long history of modeling *bound* pronouns on variables, it is historically curious that the first variable-based semantics for pronouns that takes account of their *referential* use should have entered

the literature so late, with Cooper (1979, 1983).⁴ On Cooper’s proposal, pronouns are variables, whether they are free or bound. Building on the idea in Tarski (1935) and Scott (1970) that reference occurs via an assignment of values to variables, Cooper proposes that the references of referential pronouns are fixed by assignments determined in a context of utterance, while the contents Kaplan models as *characters* are semantic presuppositions.⁵ These presuppositions are triggered by the *phi-features* (gender, number and person features) of pronouns.

On the implementation of Cooper’s analysis in Heim and Kratzer (1998),⁶ the variable in the logical form (‘LF’) of a pronoun is represented by an index, which is mapped to a value by a contextual assignment function, g , which includes an assignment of values to free variables.

If α is a pronoun and i an index, then for any assignment g , $[[\alpha_i]]^g = g(i)$ (or undefined, if i is not in the domain of g).

Features are syntactically represented as adjoined to the index representing the variable. For example, the structure of the pronoun ‘she’ is:



Semantically, features denote partial identity functions on the domain of individuals (functions of

⁴ It is equally curious that it has received so little attention from philosophers of language since (according to Perry) “many philosophers are at least tempted to suppose [bound and referential pronouns] are occurrences of a single ambiguous word” (1997, 594). This marks something of a division between the philosophical and linguistics literatures. Cooper’s semantics is accepted by many linguists (though not all; cf. Jacobson (1999) and Elbourne (2005)). This division is particularly striking since Cooper’s semantics is roughly coterminous with the early presentations of Kaplan’s *Demonstratives* (c. 1977).

⁵ Scott (1970) precedes Cooper in proposing that demonstratively used pronouns be treated as free variables that are assigned a value by an assignment function. The main innovation of Cooper’s analysis is his treatment of the assignment-independent meanings of pronouns.

⁶ See also Schlenker (2004), Sauerland (2008a/b), Heim (2008, *inter alia*) and Kratzer (2008) for representative work within the framework Heim and Kratzer (1998) present.

⁷ As Elbourne (pc) points out, this way of representing the denotation of ‘she’ is somewhat misleading, since it appears that the contribution of the phi-features of the pronoun are not part of the semantic value of the pronoun itself, which occurs on the bottom node, where it simply contributes an index. Presumably, the intent of Heim and Kratzer is that the tree itself gives the semantics of the pronoun.

type $\langle e, e \rangle$).⁸ For example, the *feminine* gender feature denotes a partial identity function, $[[fem]]$, which maps individuals to themselves, subject to the condition that the individual is female; the value of the function is undefined otherwise (hence it is a partial function). (The colon indicates the domain of values for which the function is defined.)

Gender (a) $[[\text{masc}]] = \lambda x: x \text{ is male. } x$

(b) $[[fem]] = \lambda x: x \text{ is female. } x$

Number and person features are pursued along similar lines; the number features *singular* and *plural* limit the values of pronouns to single individuals or to groups.

Number (c) $[[\text{sg}]] = \lambda x: x \text{ is an individual. } x$

(d) $[[\text{pl}]] = \lambda x: x \text{ is a group. } x$

Many authors adopt the influential lattice-theoretic treatment of singularity and plurality due to Link (1983), where a plural individual is a sum of singular ('atomic') individuals and a singular individual is the sum of itself and nothing else.⁹ It is thus common to see singular and plural features represented in the way indicated in (c') and (d') (cf. Kratzer 2006, Heim 2008).

Number (c') $[[\text{sg}]] = \lambda x: x \text{ is an atom. } x$

(d') $[[\text{pl}]] = \lambda x: x \text{ is a plurality. } x$

Lastly, person features contribute information about the relation that the individual or plurality referred to by a pronoun bears to the occupants of fixed contextual roles, like *speaker* and *addressee*. For example, the denotation of the first person feature, $[[1^{\text{st}}]]$, is a function defined only for a group that includes the speaker of the utterance context c , s_c , while $[[2^{\text{nd}}]]$ is a function defined only for a group of one or more persons that includes the addressee of c , a_c .

Person (e) $[[1^{\text{st}}]]^c = \lambda x: x \text{ includes } s_c. x$

⁸An expression of type e denotes an individual (atom or plurality). A function of type $\langle e, e \rangle$ is a function mapping individuals to individuals.

⁹Following Heim and Kratzer (1998), I will take the domain of 'individuals' to consist of atomic individuals and the sums of atomic individuals ('sum individuals'). It should be noted, however, that approaches like these which make use solely of first order quantification court difficulties related to Russell's paradox, which shows that sets and properties cannot be quantified over in first order logic alone. For the sake of consistency with the existing literature, I ignore these difficulties.

- (f) $[[2^{nd}]]^c = \lambda x: x \text{ includes } a_c, \text{ and excludes } s_c. x$
- (g) $[[3^{rd}]]^c = \lambda x: x \text{ is a salient entity and excludes } s_c \text{ and } a_c. x$

Notice that person features are *indexicals*. The domains of the functions denoted by the features *1st*, *2nd* and *3rd* person are dependent on a parameter of c , the utterance context. For example, the function denoted by the first person features of *John's* token of 'I' is defined only for John, while the function denoted by *Mary's* token of 'I' is defined only for Mary, etc.¹⁰

While the functions denoted by Cooper's features map to the same values as Kaplanian characters, there are a number of important differences between these two ways of representing the lexical meanings of pronouns. According to Kaplan, the reference of a pronoun is determined by a single total function. According to Cooper, the reference of the pronoun (or its range of values, if the pronoun is bound) is determined by a set of (partial) functions, each of which represents the semantic contribution of a single phi-feature. Cooper and Kaplan's functions are also defined over different domains. Characters are functions from *contexts* to contents, while features denote (partial) identity functions on the domain of individuals. (As we will see later, both of these differences enable Cooper's semantics to capture important scope and binding interactions between pronouns and operators that Kaplan's semantics cannot capture.)

Let us consider a couple of predictions that the Cooper analysis makes. Let g_c represent the variable assignment determined in a context c , which includes assignments to the free variables contributed by referential pronouns. Suppose that (2) is uttered in c .

(2) She _{c} has arrived.

With Heim and Kratzer (1998), we can distinguish between contexts that are *appropriate* for the interpretation of (2) and contexts in which the sentence expresses a truth-evaluable proposition:

A context c is appropriate for a LF φ if c determines a variable assignment g_c whose domain includes every index which has a free occurrence in φ .

¹⁰ As we will see, a variety of authors (Heim 1991; Sauerland 2002, 2008; Chemla 2007; Spector 2008) reject the standard inventory of features above and maintain that certain features (in particular, *3rd person*, *masculine* and *plural*) are not semantically realized and are instead pragmatic (scalar) implicatures. I return to this issue in §2.3.

Truth and falsity conditions for utterances: If φ is uttered in c and c is appropriate for φ , then the utterance of φ in c is *true* if $[[\varphi]]^{g,c} = 1$ and *false* if $[[\varphi]]^{g,c} = 0$. (1998, 243)

For c to be an appropriate context for the interpretation of (2), the assignment g_c determined in c must assign values to all free pronouns in (2). Assume that c is appropriate – that the variable assignment g_c includes an assignment to the numerical index, ‘6’, representing the free variable in the logical form of ‘she₆’. (2) will denote a true or false proposition in c iff the truth and falsity condition above is also met. This condition requires that the individual that the index 6 is mapped to by g_c be in the domain of each of the functions denoted by pronoun’s various features, *feminine*, *atomic* and *3rd person* (assume for now that $[[3^{\text{rd}}]]$ is a semantic presupposition; but see ft. 10). Bundling together the individual contributions of the phi-features of the pronoun, we might represent the lexical meaning of the pronoun ‘she’ as follows (where $[[\text{she}_i]]^{c,g} = \#$, indicates that the value of the pronoun is undefined relative to the assignment g determined in c).¹¹

$$[[\text{she}_i]]^{c,g} = [\lambda x : x \text{ is a female, atomic individual distinct from } s_c \text{ and } a_c. x](g_c(i)) = g_c(i),$$

... if $g_c(i)$ is a female, atomic individual distinct from s_c and a_c , and undefined ($= \#$) otherwise

According to this entry, ‘she₆’ in (2) will denote $g_c(6)$ if $g_c(6)$ is female, atomic, and distinct from s_c and a_c . If one of these conditions is *not* satisfied, the value of the pronoun – along with the value of any larger structure that contains the pronoun as a constituent, including (2) – will be undefined relative to g_c .¹² For example, suppose that variable assignment g_c determined in the utterance context c maps the index ‘6’ to Sarah. (To simplify matters, suppose that the variable bearing the index 6 is the unique variable in the domain of g_c .)

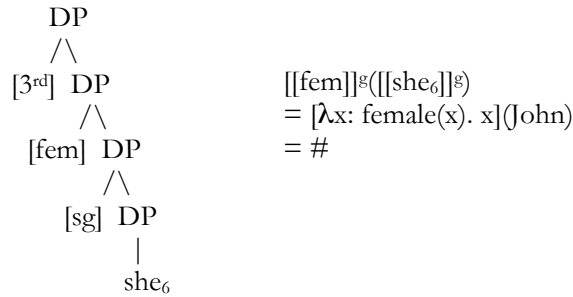
$$g_c = [6 \rightarrow \text{Sarah}].$$

Assuming that Sarah is an individual female in c , distinct from both the speaker and addressee of c , each of the functions denoted by the pronoun’s features are defined relative to this assignment, and

¹¹Following convention, I use ‘#’ to indicate that a sentence is semantically ill-formed – that its semantic value is undefined.

¹² There are various views on what happens when some part of an expression does not receive a denotation. A standard view (cf. Heim and Kratzer 1998) is that a sentence lacks a truth-value relative to a model and assignment (i.e. fails to express a true or false proposition) if some constituent does not receive a value relative to that model and assignment. There is a stronger and weaker version of this claim, which I distinguish in §2.3.

the value of the pronoun (its referent) is Sarah. However, suppose instead that the assignment g_c were to map John (a male) to ‘she_c’. While the index and the lower node corresponding to the number feature of the pronoun receive values relative to g_c , the function, $[[fem]]$, denoted by the feminine feature will fail to return a value (its value will be undefined, =#), since John is not its domain.



(Heim and Kratzer 1998, 244)

Accordingly, the value of the pronoun ‘she’ will be undefined relative to g_c , along with the value of the sentence, (2).

2.1.2 Definedness conditions and semantic presuppositions

According to Cooper, phi-features are *semantic presupposition triggers*. The definedness conditions they impose are *presuppositional definedness conditions*. (2) presupposes (falsely) *that John is female*, relative to the assignment stipulated in (b), and (truly) *that Sarah is female*, relative to the assignment stipulated in (a).

(2) She_c has arrived.

(a) If $g_c = [c \rightarrow \text{Sarah}]$:

Truth-conditional content: $[[she_c \text{ has arrived}]]^{g_c} = 1$ iff Sarah has arrived.

Semantic presupposition: Sarah is an atomic female, $\neq s_c$ or a_c .

(b) If $g_c = [c \rightarrow \text{John}]$:

Truth-conditional content: $[[she_c \text{ has arrived}]]^{g_c} = \#$

Semantic presupposition: John is an atomic female, $\neq s_c$ or a_c .

Theorists have tended to accept Cooper’s claim that features contribute semantic presuppositions on a rather thin empirical basis, consisting of truth-value gap judgments, and applications of *presupposition*

projection tests (§2.2 below). At the same time, truth-value gap judgments are notoriously unreliable indicators of semantic presupposition (von Stechow 2008 and references therein). While the projection tests offer better evidence, these tests do *not* distinguish a variety of non-presupposition and non-semantic contents from semantic presuppositions. As a consequence, Cooper’s analysis is left open to certain challenges targeting the view that the definedness conditions on pronouns are genuinely presuppositional in character. For example, some theorists have argued that features contribute extra-semantic contents (Stokke 2011), or semantic but non-presuppositional contents like conventional implicatures (Potts 2006). Ultimately, I will argue, these challenges do not succeed. The definedness conditions on pronouns *are* semantic presuppositions.

First, however, it is important to be clear about what semantic presuppositions are – in what ways they go beyond simple definedness conditions. In §2.2, I briefly introduce the notion of semantic presupposition, along with the standard tests for semantic presuppositions.

2.2 Semantic Presupposition

2.2.1 A brief introduction to semantic presupposition

The contemporary notion of semantic presupposition has its origins in a short discussion of referring terms in *On Sense and Reference* (1892), where Frege remarks on the relation between the truth-conditions of pairs of sentences like (3) and (4).¹³

(3) The man who discovered the elliptic form of the planetary orbits died in misery.

(4) There was someone who discovered the elliptic form of the planetary orbits.

According to Frege, (3) cannot be true unless (4) is true. Although this might make it appear that (3)

¹³ The history of the notion of semantic presupposition, however, goes back at least to ancient Greece:

In terms of the actual question [of who first came up with the notion of linguistic presupposition], of course it’s largely a matter of definition For the Megarians (3d century B.C.), the sophism of choice was “Do you still beat your father? Answer yes or no.” The scholastics preferred “Do you still beat your ass?” [the donkey, not fundament]. And for us moderns, “Do you still beat your wife?” 24 centuries of social progress... (*Larry Horn, ADS mailing list, 3/25/2004*; quoted in Lang 2009)

Along similar lines, Dekker (2012) notes the challenge to Aristotelian logic from Eubulides:

...if you have not lost a thing, you have it; but you have not lost horns; therefore, you have horns. (Laertius 1853, Book VII, chapter “Life of Chrysippus, section XI).

Dekker notes that “this reads like a pre-historical practical joke...[but is] a severe problem for Aristotelian logic [which seems] to endorse the principle of bivalence” (Dekker 2012).

“contains as part of its sense the thought that there was somebody who discovered the elliptic form of the planetary orbits”, Frege argues that this view cannot be right. Let p be the proposition expressed by (3) and q be the proposition expressed by (4). On the view that in uttering (3), a speaker expresses the proposition $s = (p \wedge q)$, the negation of (3),

(5) The man who discovered the elliptic form of the planetary orbits did not die in misery ,
 ... would express the proposition $\neg s = \neg(p \wedge q)$, which is logically equivalent to $(\neg p \vee \neg q)$. As Frege observes, “the negation [of (3)] would run:

‘either the man who discovered the elliptic form of the planetary orbits did not die in misery or there was no body who discovered the elliptic form of the planetary orbits’ (Frege 1892, 69-70).

These truth-conditions do not conform to our intuitive judgments about (5). Intuitively, (5) is *not* true if no one discovered the elliptical form of the planetary orbits (whether or not it is, in addition, false). In contrast with an ordinary (classical) entailment or logical consequence of (3), like (6) below, it appears that the relation between (3) and (4) is not affected by standard negation.

(6) Someone died in misery.

(Observe that (5) does not entail (6).) Instead, the logical relationship between (3) and (4) seems to be *stronger* than ordinary entailment. Frege calls (4) a ‘presupposition’ (‘Voraussetzung’) of (3).¹⁴

...wir setzen eine Bedeutung voraus. ... Nun können wir uns in jener Voraussetzung freilich irren, und solche Irrtümer sind auch vorgekommen. (Frege 1892, 31–2)

(We presuppose a reference. (. . .) We can easily be mistaken about such presuppositions, and such mistakes have occurred.) (Dekker 2012; trans. Dekker)

Two standard definitions of semantic presupposition emerge from Frege’s brief discussion. On the first, a semantic presupposition is a requirement on the bivalence of a sentence.¹⁵

¹⁴ ... also translated as ‘requirement’ or ‘pre-condition’.

¹⁵ As Soames (1989a) observes, the conception of semantic presuppositions as bivalence conditions follows from Frege’s view that sentences refer to truth-values (the True or the False). The reference (truth-value) of a subject-predicate sentence like (3) is compositionally determined by taking the value of the function referred to by the predicate ‘died in misery’ at the argument referred to by the subject term, ‘the man who discovered the elliptic form of the planetary orbits’. In a case like (3), where the subject term does not refer, there *is* no argument to the function referred to by the predicate, and (3) does not refer to a truth-value – it is neither true nor false. Consequently, (5) does not refer to a truth-value either, since the truth-value of (5) is the value of the negation function mapping true to false and false to true at the argument consisting of the truth-value of (3). Since there is no such argument (since (3) is truth-valueless), (5) lacks a truth-value just like (3). (3) and (5) are either jointly truth-valued (if the singular terms refer) or jointly truth-valueless (if they do not).

Semantic Presupposition (bivalence condition): A sentence S presupposes p just in case, if S is true or false, p is true.

According to the second, a semantic presupposition is a requirement on the truth of a sentence and its negation.

Semantic presupposition (preservation under negation): A sentence S presupposes p just in case whenever S is true, p is true, and whenever the negation of S is true, p is true.

These formulations are equivalent if one takes the negation operator (as Frege does) to be a function mapping truth to falsity, and falsity to truth that is undefined when either of its argument sentences are undefined (Beaver 2011).

On the conception of presupposition that emerges from Frege's discussion and is developed in subsequent work by Strawson (1950, 1952, 1954, 1964), presupposition is a relation between lexical items (words, sentences, etc) or a relation between lexical items and contents (e.g. propositions).¹⁶ By contrast, Soames characterizes presupposition in the following, quite different way:

To presuppose something is to take it for granted in a way that contrasts with asserting it. (1989a, 552)

According to Soames, presupposition involves an (attitudinal) relation between an *agent* (rather than a lexical item) and an object of attitude or assertion (a content).

Soames' characterization of presupposition is appropriate to the *pragmatic* conception of presupposition originating in the work of Stalnaker (1970, 1973, 1974, 1998, inter alia). On the pragmatic conception, "the proper object of philosophical study is not what words or sentences presuppose, but what people presuppose when they are speaking" (Beaver 2011). According to Stalnaker, "it is *speakers* who make presuppositions", where "what they presuppose are things they

¹⁶ The semantic notion of presupposition encapsulated by the pair of definitions above is oftentimes referred to as the 'Frege-Strawson theory' of presupposition. Strawson is credited with the first extended discussion of semantic presupposition and with developing a partial logical approach to presupposition in his (1952). Furthermore, Strawson's criticisms of Russell's (1905) theory of definite descriptions as quantificational expressions also played an important role in renewing interest in the topic following a period during which Russell's semantics was widely accepted..

take for granted when they speak” (emphasis added):¹⁷

The roughly received view was that Q presupposes that P if the truth of P is required for either the truth or falsity of Q. But [...] it seemed to me that the relevant notion of presupposition is one that should be characterized independently of the truth-conditions of what is said by speakers making presuppositions [...] It is speakers who make presuppositions; what they presuppose are things they take for granted when they speak – things they take to go without saying. (Stalnaker 1998, 7)

Importantly, Stalnaker does *not* deny that there are semantic presuppositions in the sense of *lexicalized* presuppositions. However, the semantic presuppositions of a sentence are reconceived as conditions on the common ground – a special kind of pragmatic presupposition, where a speaker presupposes that p in uttering S “because the semantic rules for the sentence failed to determine a truth-value for the sentence in possible worlds where the required proposition is false”:¹⁸

The relation between the semantic notion of presupposition and the pragmatic notion of presupposition requirement is not... just accidental. Among the reasons that a pragmatic presupposition might be required by the use of a sentence, by far the most obvious and compelling reason would be that the semantic rules for the sentence failed to determine a truth-value for the sentence in possible worlds where the required presupposition is false. (Stalnaker 1974, 36)

According to some authors, the differences between the semantic and pragmatic conceptions of lexicalized presuppositions are not very great. For example, Yablo writes that on the semantic account, the first relatum is “utterances of tokens of S, from which it is a short step to speakers presupposing this or that in uttering S”:

It does little violence to either’s position to treat “S presupposes π ” as short for “All (or most, or contextually salient) utterances of S presuppose π ,” and that in turn as short for “Speakers in making those utterances always (often, etc.) presuppose that π .” (2006, 165)

Similarly, Geurts (1999) writes:

¹⁷What, precisely, is the nature of this attitudinal relation between speakers and contents? Both Soames and Stalnaker appeal to the notion of a speaker’s *taking something* (a content) *for granted*. Elsewhere, Stalnaker (1994), the attitude is a conjunctive one: a proposition *p* is presupposed just in case speakers take *p* for granted *and* belief that their interlocutor take *p* for granted. Some of Stalnaker’s other formulations are less attitudinal and more action or disposition-oriented. For example, Stalnaker (1973, 448) writes:

A speaker presupposes that *P* at a given moment in a conversation just in case he is disposed to act, in his linguistic behaviour, as if he takes the truth of *P* for granted, and as if he assumes that his audience recognizes that he is doing so.

Here it is not *accepting* or *believing* that *P* (in the context/for the purposes of conversation) but *being disposed to act as if one accepts or believes* that *P* (in the context/for the purposes of a conversation) that makes *P* a presupposition.

¹⁸ Specifically, the semantic presuppositions of a sentence *S* are the propositions p_1, \dots, p_n that must be true at every world *w* in the set of worlds *w* obtained by intersecting the propositions in the common ground (“the context set”) because the semantic rules for *S* do not determine a truth-value for *S* at worlds *w* at which *p* is not true.

[W]henver it is said that sentence ϕ presupposes that, what is actually meant is that, normally speaking, a speaker who uttered ϕ would thereby commit himself to the presupposition that χ is true. (4)

The conceptual distance between the pragmatic and semantic notions of presupposition is greater than these comments suggest, however. One important difference is located in the different *satisfaction conditions* associated with the two kinds of presupposition. On Frege-Strawson semantic models, a presupposition p of a sentence S is a proposition that must be true at the actual world w and context c for S to be true or false at c in w . On pragmatic models, p must be true at the worlds w' in the context set c' , the set of worlds w obtained by intersecting the propositions in the common ground determined by the mutually held beliefs of conversational participants. These criteria will diverge just as soon p has a different truth-value at the actual world w and some world w' or worlds w', w'', \dots in the context set (i.e. just as soon as conversational participants pragmatically presuppose that p is true, *contrary to fact*). Suppose, for example, that the conversational participants mistakenly believe *that there is a unique King of France*. Assume also, with Frege, that definite descriptions are associated with definiteness (uniqueness and existence) presuppositions. The presuppositions of an utterance of “The King of France is bald” will be satisfied on the pragmatic view, since the proposition *that there exists a unique King of France* is true at every world in the context set. These presuppositions will not be satisfied on the semantic view, however, which requires that the proposition *that there exists a unique King of France* be true – and not merely *believed* to be true. (For discussion of other difficulties with capturing semantic presuppositions in pragmatic frameworks, see Karttunen 1973, Soames 1989a, and Atlas 2002, 34-36.)

Even if the notions of semantic and pragmatic presuppositions diverge, however, they do not diverge in ways that will concern us in this chapter. Cooper’s claim is that pronouns are associated with ‘semantic’ – in the sense of *lexicalized* – presuppositions. This is to be distinguished from the narrower claim that features trigger semantic presuppositions *as opposed to Stalnakerian purely pragmatic presuppositions*. This second claim is not the one that is at issue. Since the Stalnakerian pragmatic model retains the view that some presuppositions derive from the lexical meanings of linguistic

items, there is (fortunately) no need to decide between these two different models.¹⁹

2.2.2 Presupposition projection tests

One question that is important to the present discussion is how presuppositions are to be distinguished from other kinds of contents. As we have just seen, one distinctive feature of semantic presuppositions is that they impose conditions on the truth-evaluability of sentences. Thus one way to test whether some proposition p is a semantic presupposition of a sentence S is to consider whether S would be either true or false if p were false. However, judgments of truth-value gaps are notoriously unreliable indicators of semantic presupposition.²⁰ A preferred method of testing for presupposition involves a battery of ‘projection tests’. As Soames observes, presuppositions are characteristically inherited in complex constructions that are not entailment-preserving.

[C]ommitments that are presupposed are highly heritable, whereas those that are only asserted are not. If assertive utterances of a sentence S are used to assert A and presuppose P , then assertive utterances of more complicated sentences containing S often presuppose P without carrying any commitment to A . (1989a, 554)

When a sentence S inherits the semantic presupposition p of one of its constituents, p is said to *project* from S . The family of projection tests exploits the unique inheritance properties of semantic presuppositions, turning their characteristic projection behavior into a diagnostic.

The most familiar projection tests make use of presupposition *holes*: compositional contexts where presuppositions are preserved (Karttunen 1973).²¹ We have already seen that presuppositions are preserved under *negation*. For example, the implication of (7) (*that there is a King of France*) is preserved in the presupposition hole created by standard (non meta-linguistic) negation operators like the one in (8).

(7) The King of France drinks Ovaltine

(8) The King of France does not drink Ovaltine.

¹⁹ Of course, it may be that there are particular difficulties that arise for attempts to capture the implications associated with phi-features on one or the other of these models. It goes beyond the aims of this chapter to attempt to settle larger issues concerning whether the semantic or pragmatic models are more adequate for the purposes of capturing the contributions of phi-features.

²⁰ For discussion of this topic, see von Stechow (2004a) and Schoubye (2011).

²¹ See Beaver (1997) and Geurts (1999, Ch.1) for a summary of Karttunen’s (1973) observations concerning presupposition projection and discussion of recent developments.

Other presupposition holes include yes/no question constructions and the *if*-clauses of conditionals. The complex sentence (9), which has the form *if* φ , ψ , carries the implication *that there exists a unique King of France*, indicating that the presupposition of the *if*-clause φ is inherited by the complex sentence. The same implication is inherited by the yes/no question in (10). Notably, neither complex construction preserves the ordinary entailments of (7) (e.g. *that the King of France is drinking something*).

(9) If the King of France is drinking Ovaltine, then it must be bedtime.

(10) Is the King of France drinking Ovaltine?

Along with presupposition holes, there is a small class of expressions that are presupposition *cancelling*. These are the presupposition ‘plugs’, which include verbs of saying (‘said’, ‘told’, ‘announced’). Finally, there are some contexts that are intermediate between plugs and holes in that they neither wholly preserve nor wholly cancel presuppositions. Presupposition ‘filters’ alter or partly (but not wholly) cancel presuppositions. The family of presupposition filters includes non-factive attitude verbs (‘believe’, ‘want’, ‘hope’) and conditional consequents. I will have more to say about filters later on, in §2.3.

Presupposition projection tests have been used to uncover a variety of presupposition triggers beyond the prototypical example of definite descriptions. For example, factive verbs like ‘realize’, ‘know’ and ‘see’, are said to presuppose the truth of their complement clauses (they are defined only over pairs consisting of individuals and *true* propositions).²² All of (11)-(13) entail *that it is raining*, even though the presupposition holes in (12)-(13) do not preserve the ordinary entailments of (11) (e.g. *that John realizes something*).

(11) John realizes that it is raining.

(12) John doesn’t realize that it is raining.

(13) Does John realize that it is raining?

‘Aspectual’ verbs and adverbs like ‘start’, ‘stop’, ‘still’ and ‘again’ trigger propositions concerning the

²²Frege defines predicates as denoting *total functions*, precluding a treatment of them as presuppositional expressions. Soames (1989) suggests that since presupposition was not one of Frege’s central concerns, he simply did not consider nonreferential examples of presupposition triggers. Moreover, his semantics is easily extended to provide a unified account of both referential and non-referential presuppositions.

truth or falsity of the proposition expressed by the clause they (or the verbs they modify) embed at times before or after the reference time (this is typically, but not always, the time of utterance). For example, (14) presupposes that it had been raining for some time preceding (let's assume) the utterance time *t*.

(14) It stopped raining.

(15) It hasn't stopped raining

(16) Has it stopped raining?

(17) It had been raining (for some interval immediately preceding *t*)

Additive particles like 'too', 'as well', and 'again' are also said to be presupposition triggers. The presuppositions these particles trigger are often dependent on context and resist straightforward paraphrase (Soames 1989a, Kripke 2009).²³ For example, it is tempting to say that (18) (with focus on 'John', indicated by italics) presupposes that someone other than John is having dinner in New York, (21).

(18) *John* is having dinner in New York, too.

(19) Will *John* have dinner in New York, too?

(20) *John* isn't have dinner in New York, too.

(21) Someone other than John is having dinner in New York.

As Kripke (2009) observes, however, this paraphrase is unsatisfactory. An utterance of (18) will be infelicitous in an out-of-the-blue context even if it is clear that there are *many* New Yorkers, in addition to John, who are having dinner. What seems to be required (roughly) is that there be some *salient* alternative to John presently having dinner in New York.

As we have seen, Cooper maintains that phi-features are another kind of semantic presupposition trigger. The projection tests seem to support this analysis. Suppose that a speaker utters (22), demonstrating John.

²³ According to some authors, focus-sensitive particles like 'too' and 'also' contribute conventional implicatures rather than semantic presuppositions (Potts 2005 *inter alia*). My own view is that these particles contribute *expressive* semantic presuppositions of the kind I discuss later on in this chapter.

(22) She_e is the only woman this room. (assignment $g_e(6) = \text{John}$)

Many speakers are ‘squeamish’ (Strawson 1964, 116) when asked to judge whether (22) is true or false – unwilling to accept that (22) is true but also reluctant to judge that it is straightforwardly false. Moreover, the negation of (22), (23), still seems to carry the implication that John is female. Suppose that a second speaker were to reply to the first by uttering:

(23) She_e is *not* the only woman this room. (assignment $g_e(6) = \text{John}$)

Our second speaker, like the first, will be taken to be committed to the implication that John is female. Only the asserted content of (22) – that there are *other* women in the room – is semantically negated. Similarly, *if*-clauses and *yes/no* questions do not alter or cancel the implications associated with phi-features.

(24) If she is not the only woman in this room, then the others must be hiding.

(25) Is she the only woman in this room?

Both of these complex sentences inherit the implication *that John is female* – as they would a semantic presupposition.

In (22), I have picked the more difficult case of 3rd person pronouns. It seems particularly clear that the implications associated with 1st and 2nd person features do not cancel under negation or in other presupposition holes. (Witness, for example, that our (a) sentences are not merely false but mildly self-contradictory.)

(26) John: I am speaking

(26a) I am not speaking.

(26b) If I were speaking, I would exist.

(26c) Am I speaking?

Implication: John is the speaker.

(27) John to Mary: I am speaking to you.

(27a) I am not speaking to you.

(27b) If I were speaking to you, then our fight would be over.

(27c) Am I speaking to you?

Implication: Mary is John's addressee.

In the following section, I consider what we can (and can't) we conclude about the presuppositionality of phi-features on the basis of their projection behavior.

2.2.3 Semantic presupposition, entailments, and conversational implicatures

Presupposition projection tests are a good way to distinguish semantic presupposition from certain pragmatic phenomena – notably, Gricean *conversational implicatures*. On a Gricean (1975) model of the semantics/pragmatics interface, pragmatic content is post-semantic or post-propositional content driven by inferences governed by four conversational maxims. These are: the *maxim of quality* (make your contribution true; so do not convey what you believe false or unjustified); the *maxim of quantity* (be as informative as required); the *maxim of relation* (be relevant); and the *maxim of manner* (be perspicuous; avoid obscurity and ambiguity, and strive for brevity and order) (Grice 1975, 28).²⁴ These maxims (specifically, violations of them) provide the basis for inferences that generate conversational implicatures.

Suppose a speaker utters (28). Under ordinary conditions, the speaker's utterance will generate a (scalar) implicature *that John did not finish (or the speaker does not know whether John finished) his homework* (Horn 1972).²⁵

(28) John finished most of his homework.

Conversational implicature: John did not finish all his homework/the speaker does not know whether John finished all of his homework.

(29) John finished all of his homework.

²⁴ These slogans are only rough characterizations of the contents of the Gricean maxims, adequate because the topic of conversational implicature does not figure centrally in what follows. A more extended discussion (Davis 2010) can be found in the SEP: <http://plato.stanford.edu/entries/implicature>.

²⁵ Which of these implicatures arise will depend in part on how good the epistemic position of the speaker is taken to be with respect to the question whether John finished his homework. If it is expected that the speaker will know whether John finished his homework or not, then we expect the stronger implication that John did not finish all of his homework.

Why does this implicature arise? According to Grice, a speaker's audience assumes, and the speaker assumes that her audience assumes, that the speaker is obeying the maxims of communication – in particular, the maxim of quantity, which enjoins the speaker to make her contribution as informative as conversational purposes require. Assuming that the additional information conveyed by (29), that John finished *all* his homework, would be of value (in particular, that it is relevant to conversational purposes; cf. the maxim of *relation*) then the most straightforward explanation of the speaker's utterance of (28) (rather than the more informative (29)) is that (29) is false or the speaker does not know that it is true (hence the speaker cannot utter (29) without violating the maxim of *quality*).

An important feature of conversational implicatures is that they do not survive under negation or in other presupposition holes. The conversational implicature, (28a), *that John did not finish all of his homework* is cancelled in (30)-(32), like the entailment, (28b); none of (30)-(32) conversationally implicate that John did not finish all his homework.

(28) John finished most of his homework.

(28a) Conversational implicature: John did not finish all of his homework.

(28b) Entailment: John finished most of something.

(28c) Semantic presupposition: John has homework.

(30) If John finished most of his homework, he gets a prize.

(31) John didn't finish most of his homework

(32) Did John finish most of his homework?²⁶

²⁶There are a number of additional ways to distinguish conversational implicatures from semantic presuppositions. Other tests appeal to the cancelability of conversational implicatures. The conversational implicature *that John did not finish all his homework* is canceled in (a)

(a) John finished most of his homework – in fact, he finished *all* of it.

(b) ? John finished most of his homework – in fact, John has no homework.

By contrast, the presupposition *that John has homework* is not cancellable. (b) entails that John finished his homework (though the issue is complicated somewhat by the – purported – existence of *metalinguistic* negation; see Horn 1989).

Grice (1967) also describes conversational implicatures as *calculable* (on the basis of conversational maxims and asserted meanings) and *non-detachable*, where an implicated content *p* is non-detachable just in case the implicature does not arise if a different expression or form of expressions with the same truth-conditional semantic content is substituted (e.g. if 'and' is substituted for 'but').

The implicature is nondetachable insofar as it is not possible to find another way of saying the same thing (or approximately the same thing) which simply lacks the implicature. (1967, 43)

By contrast, the presupposition *that John has homework* survives embedding – as does the implication of the masculine feature of the possessive pronoun ‘his’, *that John is male*.

Since conversational implicatures do not pass standard presupposition projection tests while the implications associated with features *do*, we can safely exclude conversational implicature-based analyses of the semantic contributions of features. However, the projection tests are not *foolproof* guides to semantic presupposition. We will see that there are a variety of phenomena including *conventional* implicatures, purely pragmatic presuppositions and certain extra-semantic (e.g. pre-semantic) conditions on definedness that exhibit presupposition-like projection behavior. Accordingly, the argument for the Cooper analysis of features must reach beyond the standard projection tests to exclude these alternative accounts of their role.

2.3 Cooper’s semantics: objections and replies

2.3.1 Phi-features: A conventional implicature-based account

While conversational implicatures are relatively easy to distinguish from semantic presuppositions on the basis of their projection behavior, *conventional* implicatures present a greater challenge. Conventional implicatures are like semantic presuppositions in a number of important ways. First, they are *not* driven by maxims of communication, as their conversational counterparts are.

[A conventional implicature] arises from the particular choice of words or syntax, rather than from conversational maxims. (Partee 2009b, 5)

Just as presuppositions are “*semantic* contents, another component of the total package of information that a sentence can be used to convey”, conventional implicatures are also properly semantic contents (Heim 1990, 4).²⁷ However, the key *difference* between conventional implicatures

By contrast, presuppositions and *conventional* implicatures (to be discussed shortly) are said to be non-calculable, non-cancellable, and detachable.

²⁷ As a result of the similarities between the two kinds of contents (and in some cases, due to substantive theoretical commitments), some authors have used the terms ‘conventional implicature’ and ‘semantic presupposition’ interchangeably. Potts (2007) traces this practice back to Karttunen and Peters (1979), who maintains that presuppositions can be true or false independently of the main descriptive content of a sentence – a conception of presupposition close to Grice’s original conception of conventional implicature. (Though it should be noted Grice did not say all that much about the mechanism of conventional implicature – only that conventional implicatures were semantic conditions and extra truth-conditional.)

and presuppositions is that conventional implicatures are not *truth-conditional* semantic contents; the truth of a sentence's conventional implicatures is not necessary for the truth of the sentence itself.

If there are conventional implicatures, they must be conventional and they must be implicatures. An implicature is different from an entailment or a semantic presupposition, in that it is not necessary for the truth of the sentence. (Bach 1999, 329)

[Conventional implicatures are] part of the meaning of a word or construction but not part of its (at issue) truth-conditions. (Partee 2009b, 5).

In this respect, conventional implicatures are *like* their conversational counterparts: If a sentence *S* expresses the semantic content *p* and implicates that *p'* – conversationally (on an occasion of use) *or* conventionally – then *S* can be true while *p'* is false. By contrast, a presupposition is a truth-condition of a sentence that is also a truth-condition of its negation: If *S* presupposes *p*”, then *S* expresses a truth-evaluable proposition only if *p*” is true.

However, another way conventional implicatures are like semantic presuppositions is that they typically survive the family of projection tests.

Bach (1999) supplies the following partial list of implicative linguistic items (Bach himself denies that these – or any other lexical items – are implicative; according to Bach, *there are no conventional implicatures*).²⁸

- *adverbs*: already, barely, either, only, scarcely, still, yet, too, also²⁹
- *connectives*: but, nevertheless, so, therefore, yet
- *implicative verbs*: bother, condescend, continue, deign, fail, manage
- *subordinating conjunctions*: although, despite (the fact that), even though³⁰

While Karttunen and Peter's empirical claim that descriptive meanings can survive presupposition failure has not been widely accepted, and the view of presuppositions as definedness conditions continues to dominate, their use of 'conventional implicature' for presuppositions, Potts notes, has (in some corners of the linguistics literature) "blossomed into a license to use the two terms interchangeably" (Potts 2007, 671).

²⁸According to Bach:

There is no such thing as conventional implicature and... the phenomena that have been described as such are really instances of something else. (Bach 1999, 327)

Bach identifies some putative conventional implicatures (like those associated with 'but') with entailments, and others (like those associated with 'moreover' and 'therefore') with higher order comments on the content of a speech act (*cf.* Grice 1989, 362 on higher order speech acts). For the purposes of argument, I assume that conventional implicatures are a real phenomenon.

²⁹ The reader will notice that 'too' appeared earlier, in §2.2.2, as a presupposition trigger. There is debate about whether 'too' (and also, 'also') are conventional implicatures or semantic presuppositions. See Potts (2003) for a conventional implicature-based analysis.

Consider an implicative verb from our list, e.g. ‘managed’. A sentence like (33) is said to conventionally implicate *that it required effort/was difficult to start the car* (Sanders 1987, 59).

(33) Mary managed to start the car

Conventional implicature: *it required some effort/was difficult to start the car.*

Notice that this implicature survives embedding under negation and in yes/no questions:

(33a) Mary didn’t manage to start the car

(33b) Did Mary manage to start the car?

Similarly, the adverb ‘already’ is associated with a conventional implicature that the event or activity in question took place earlier than expected. On this view, (34) conventionally implicates *that Mary started the car sooner than expected* – as do (34a) and (34b):

(34) Mary started the car already.

(34a) Did Mary start the car already?

(34b) Mary hasn’t already started the car.

Conventional implicature: *Mary started the car sooner than expected.*

How, then, are we to distinguish conventional implicatures from semantic presuppositions, if conventional implicatures pass the family of projection tests, and truth-value judgments are unreliable?

In a series of recent papers, Potts (2003, 2005, 2007) argues that there are important differences between presuppositions and conventional implicatures that go beyond their truth-conditional status. Potts (2003) extracts three distinctive properties of conventional implicatures from Grice (1975, 44-45).

(a) Conventional implicatures *are speaker-oriented*: The commitments made via conventional implicatures are made by the *speaker* of the utterance, and remain ‘speaker oriented’.

(b) Conventional implicatures *are scopally inert*: conventional implicatures remain ‘speaker-

³⁰ See Davis (2010) for more examples. Potts (2003, 2005, 2007) excludes some of the examples above, and argues for the inclusion of (inter alia) parenthetical *as-clauses*, non-restrictive relative clauses, nominal appositives, parenthetical adverbs and expressives.

oriented' even when embedded.

(c) Conventional implicatures *are independent from at-issue meaning*: conventional implicatures are logically and compositionally independent from at-issue meaning.

Potts argues that there are a variety of implicatives that do not appear in Bach's list, which display both the traditional features of conventional implicatures and the features in (a)-(c). These include DPs/NPs in apposition, like 'a confirmed psychopath' in (35), and expressives, including attributive adjectives like 'fucking' in (36) (also epithetic/pejorative terms).

(35) Sue believes that Chuck, a confirmed psychopath, is a suitable babysitter – # but Chuck isn't a psychopath.

Conventional implicature: Chuck is a confirmed psychopath.

(36) John believes that that his fucking brother-in-law is on his way – # but I think he's great.

Conventional implicature: The speaker holds a negative attitude toward John's brother-in-law.

In the case of (35), Potts observes, it is the *speaker* who is committed to the proposition *that Chuck is a confirmed psychopath* rather than Sue (who, presumably, would not believe Chuck to be a suitable babysitter if she knew of his psychopathy). Similarly, (36) implicates that *the speaker* (rather than John) has a negative attitude toward John's brother-in-law.

Since the conventional implicatures associated with (35) and (36) are wedded to the perspective of the speaker rather than the subject of the report, (35) and (36) also witness the property of *scopal* inertness: there are no narrow scope readings of the sentences where the implicature displaces from the speaker and becomes associated with the subject of the higher verb ('believe'). More traditional examples of conventional implicatures like 'but', in (37), also do not exhibit this kind of displacement.

(37) John believes that Chuck is charming but dangerous – # but only John thinks there's a contrast (between being charming and dangerous).

Here it is John who is attributed the belief that Chuck is charming and dangerous, but the *speaker* (rather than John) who is committed to the existence of a contrast between the pair of properties,

being charming and *being dangerous*.³¹

What of the third property Potts associates with conventional implicatures, *independence from at-issue meaning*? By ‘at-issue meaning’, Potts means *truth-conditional* meaning. Consequently, the first half of the independence claim concerning the *logical* independence of at-issue meaning amounts to the earlier observation that conventional implicatures (unlike entailments and semantic presuppositions) are not truth-conditional contents. Meanwhile, the claim that conventional implicatures are *compositionally* independent is closely related to the claim that conventional implicatures are *scopally inert*, since one way – perhaps the main way – for conventional implicatures to exhibit *non-independence from at-issue meanings* is through scope interactions with quantifiers and operators.

In contrast with conventional implicatures, Potts maintains, semantic presuppositions are typically *not* speaker-oriented, scopally-inert, *or* independent from at-issue meaning. For example, whereas the conventionally implicated negative attitude toward John’s brother-in-law in (36) above is not ‘trapped’ by the attitude verb, the presupposition *that John has a brother-in-law* can be. There is a natural reading of (38), predicted on the view that non-factive verbs of attitude are presupposition *filters* (Karttunen 1973, Heim 1992), on which the presupposition *that John has a brother-in-law* is altered or partly cancelled, so that the weaker presupposition that projects is *that John believes he has a brother-in-law*. Thus a speaker can (without contradiction) deny the stronger presupposition that John in fact has a brother-in-law, as in (38) and (39).

(38) John mistakenly believes that he has a brother-in-law and he believes that that his brother-in-law is on his way.

(39) John believes that that his brother-in-law is on his way – but he doesn’t really have a brother in law.

Since standard examples of semantic presuppositions filter in e.g. belief constructions, they are *not*

³¹(37) displays Grice’s “model case” (1967, 46) of conventional implicature, the distinction between ‘and’ and ‘but’. According to Grice, ‘and’ and ‘but’ share their truth conditional content, but ‘but’ has an implied content that ‘and’ lacks.

Frege (1879) was the first to observe that there is a non-truth-conditional difference in meaning between ‘and’ and ‘but’. He called it ‘Beleuchtung’ (‘illumination’) or ‘Fäbung’ (‘colouring’).

tied to the perspective of the speaker (cf. Potts' property (a) of conventional implicatures). More generally, since they can be filtered and plugged, they interact with various kind of operators and are therefore not scopally inert or (correlatively) compositionally independent (cf. Potts' properties (b) and (c)). Thus while the behavior of conventional implicatures and semantic presuppositions is the same with respect to presupposition *holes*, the two kinds of content differ in the ability of each to take narrow scope in various constructions and to be *filtered* and *plugged*.

For ease of reference, some of the typical features of entailments, presuppositions, and implicatures are summarized below.

	Entailments	Semantic presuppositions	Conversational implicatures	Conventional implicatures
Semantic content	yes	yes	no	yes
Truth-conditions	yes	yes	no	no
Project from holes	no	yes	no	yes
Interact with operators	yes	typically ³²	no	no

Earlier, we saw the implications associated with phi-features have a number of properties that distinguish them from conventional implicatures, but what are the prospects for a *conventional* implicature-based account?

One difficulty for Cooper's semantics for pronouns is that the implications associated with phi-features seem to have a number of the properties of conventional implicatures. Traditional wisdom has it that personal pronouns are paradigms of 'speaker-oriented' (or 'perspectival') expressions, their references determined in relation the speaker of the context. Moreover, their meanings seem to be *logically* independent of at-issue contents i.e. truth-conditions. On a traditional Kaplanian picture, for example, characters are said to determine the truth-conditional contents of

³² On the view that focus particles like 'too', 'also' and 'even' are semantic presupposition triggers, not all semantic presuppositions *will* interact with operators. The contents associated with these particles are anaphoric or indexical contents, tied to the utterance context. Notice, for example, that the presupposition *that some (salient) alternative to John will come* projects up past the context created by the attitude verb.

(a) Mary believes that *John* will come too.
 Since 'believe' is a presupposition filter, the presupposition we would independently expect is the weaker presupposition *that Mary believes that some (salient) alternative to John will come*. It is not clear that this weaker presupposition projects, rather than the stronger presupposition *that some (salient) alternative to John will come*.

pronouns (their references), and then drop from the picture. Characters are also said to be *scopally inert*, relating the references of pronouns to fixed contextual parameters that cannot be shifted by operators.

[I]ndexicals always take primary scope. If this is true - and it is - then no operator can control the character of the indexicals within its scope, because they will simply leap out of its scope to the front of the operator. I am not saying we could not construct a language with such operators, just that English is not one. And such operators could not be added to it. (Kaplan 1989a, 510)

Extra-propositional contents are not always extra truth-conditional and compositionally inert, of course. In particular, *semantic presuppositions* are extra-propositional, truth-conditionally significant – and (at least in paradigm cases) compositionally ‘active’. Consequently, it may seem that the meanings associated with pronominal features have more of the properties of *conventional implicatures* than semantic presuppositions.

Cooper himself (1983, 180-183) observes that features appear to be scopally inert in ways that standard semantic presupposition triggers are not. According to Cooper, the implications associated with the features of pronouns do *not* take narrow scope (i.e. filter or plug) in the way that standard presuppositions do. For example, suppose that Watson is speaking with a man disguised as a woman, and that Watson is (but the speaker is not) taken in by the disguise. Consider the following pairs of reports:

- (40) a. Watson believes that the woman he is speaking with is the murderer.
b. Watson believes that the man he is speaking with is the murderer. (both available)
- (41) a. #Watson believes that she is the murderer.
b. Watson believes that he is the murderer. (one available)

Each of the sentences that make up the pair in (40) has a true reading. (40a) has a true *de dicto* reading, where the definite description takes scope under ‘believe’. On this reading, the presupposition associated with the definite description is filtered by ‘believe’ so that the presupposition that projects is that *Watson believes that there is a unique woman he is speaking to*. There is also a true reading of (40b),

the de re reading, where the definite description takes widest scope³³ and the presupposition that projects is the wide scope (unfiltered) presupposition *that there exist a unique man Watson is speaking to*. By contrast, the counterpart of (40a), (41a), where the definite description is replaced by the pronoun ‘she’, does *not* have a true reading. The implication associated with the feminine feature appears to be ‘scopally inert’; it refuses to take narrowest scope, and (41a) falsely implicates *that the person Watson is speaking to is female*.

The contrast is, of course, clearest in the case of 1st and 2nd person pronouns. The implications associated with 1st and 2nd person features do not filter, displacing to the subject of report so that e.g. (42) presupposes *that John believes that Mary is the speaker*.

(42) John believes that I am tired.

(43) John believes that you are tired.

The scope-taking possibilities of the pronominal presuppositions thus appear to be rather different from the scope-taking possibilities of standard presupposition triggers like definite descriptions. The presuppositions associated with standard triggers can take narrow scope relative to (i.e. be filtered or plugged by) attitude verbs and other operators, requiring satisfaction in embedded contexts. By contrast, examples like (41)-(43) seem to show that the presuppositions triggered by features behave scopelessly, requiring satisfaction in the speech context, even when embedded.

Should we then conclude that the implications associated with features are conventional implicatures? Potts (2005, 2006) endorses a conventional implicature-based analysis of *formal* and *familiar* features in languages like German and French on the grounds that these features do not interact with operators in sentences like (44).³⁴ Here the ‘only’-DP quantifies indifferently over

³³ It is not altogether clear whether the *description itself* must take wide scope in order for the stronger presupposition to project. See Heim (1990) for alternative accounts of the projection facts.

³⁴ Potts maintains that formal and familiar features are expressive items (terms/particles), in the same general category as epithets (‘honky’, ‘Boche’, etc.), expressive attributive adjectives (‘damn’, ‘fucking’, etc.), and some uses of diminutive suffixes. Expressive terms should be distinguished from expressive presupposition triggers (discussed in §2.3.5), which are distinguished from other semantic presuppositions by their role in determining propositional or truth-conditional contents. Expressive terms, of the kind Potts is interested in, are distinguished by their attitudinal aspect; they convey contents (according to Potts, conventional implicatures) concerning the attitudes of agents.

individuals with whom the speaker is and is not on familiar terms, despite the familiarity requirement on the bound pronoun ‘Deine’ (your).

(44) Nur Du hast Deine Hausaufgabe gemacht.

Only you.FAMILIAR have your.FAMILIAR homework done.
‘Only you did your homework’ (Potts 2006, 25)

As Potts observes:

The familiar feature is completely missed by the quantifier. It does not partialize the domain to entities with whom the speaker is on familiar terms, nor does it convey that the speaker is on familiar terms with everyone in the domain. (ibid)

If gender, number and person features on English pronouns *also* display the property of scopal inertness – if they do not take narrow scope (i.e. filter or plug) – perhaps they, too, should receive conventional implicature-based analysis?

If the implications associated with features truly did not take narrow scope – did not filter or plug – then this *would* be reason to be skeptical of the claim that they are semantic presuppositions and open to a conventional implicature-based analysis. However, their scope-taking behavior is in fact considerably more complex than previous examples like (41)-(43) suggest. Consider (45).

(45) Whenever I pour wine, the damn bottle drips. (Potts 2006, 6; citing Florian Schwarz, p.c.)

As Potts observes, while the choice of bottle can vary with the choice of pouring events, the meaning of ‘damn’ does not vary:

One might expect the meaning of damn to vary as well, so that the example would assert that in all situations *s* such that the speaker pours wine in *s*, the bottle in *s* drip in *s* and the speaker is in a heightened emotional state in *s*.

According to Potts, what we instead infer from the speaker’s use of ‘damn’ is that the speaker “is in a heightened emotional state right this minute” rather than in the various pouring-and-dripping situations (2006, 6). Now consider (46)-(47). In contrast with (45), the contributions of the gender and number features on the pronouns are *not* missed by the quantifier. The adverbial quantifier ‘whenever’ in (46) picks up the implication associated with the feminine and plural features of the pronouns, and (46) conveys that, for every situation *s* such that the speaker meets a date in *s*, the speaker’s date in *s* is female. Meanwhile, (47) conveys that for every situation *s* such that the speaker hires workers from

the temp agency in *s*, there is a single worker who the speaker hires in *s*.

(46) Whenever I meet a date for the first time, she asks me why I still live with my parents.

(47) Every time I hire from that temp agency, he never shows up.

We will see in the following chapter that examples like these, where the features of pronouns *do* partialize the domain of quantification in the way that we would expect if features were interpreted in the scope of a quantifier, are *very* far from being exceptional.

But what of our earlier examples like (41a), where the implication concerning the gender of the murderer does not displace to the subject of ‘believe’?

See the man impersonating a woman over there?

(41) a. #Watson believes that she is the murderer.

b. Watson believes that he is the murderer. (one available)

In recent work (2010), Yanovich shows that the scope-taking possibilities of pronouns under non-factive attitude verbs are more complicated than our earlier, perfunctory examination of cases like (41) suggests.

Suppose Holmes and Watson are investigating a suspicious death. Holmes knows that it was a suicide, but Watson believes that the victim was murdered and that the murderer was a woman.

Compare (48) and (49):

(48) (Watson believes that the victim was murdered and that the murderer is a woman...)

Watson believes that she used poison.

(49) (Watson believes that the victim was murdered and that the murderer is a woman...)

Watson believes that #he used poison.

The pronouns ‘she’/ ‘he’ cannot *refer* – since the victim was not murdered, there is no actual murderer to serve as their referents. The only readings of the reports are de dicto readings, where the

presuppositions associated with the pronouns concern the properties of Watson’s imagined murderer. Since Watson believes that the murderer is female, (48) is the only acceptable report.³⁵

According to Yanovich, features trigger presuppositions that must be satisfied in the *least embedded* context where the pronoun can find an appropriate referent or range of values. This context “often, but not always, is the actual world” (2010, 14). In cases involving multiple embeddings, the least embedded context may be an *intermediate* context. For example, suppose Watson and Holmes’ victim was a suicide and that *both* believe that the victim was murdered. However, whereas Watson believes that the murderer was a woman, Sherlock believes that the murderer was a man. Yanovich observes that the presupposition contributed by the pronoun is satisfied not in the reporting context or in the most embedded context, but in the intermediate context created by the first occurrence of ‘believe’.

(50) Watson believes that Sherlock believes that she/#he used poison.

In other words, (50) generates the implication that *Watson* believes that the murderer is female – the implication concerns Watson’s beliefs about the gender of the murderer rather than the actual facts concerning the gender of the murderer or Sherlock’s beliefs about those facts. As we will see in Chapter 4, Yanovich’s generalization is slightly too strong. However, the important point for present purposes is that behavior of pronouns under operators is not captured by the simple Kaplanian slogan that *characters* (or feature-based implications, more generally) *take obligatory wide-scope*. Their scope-taking behavior is considerably more complex.

Since the implications associated with features are *not* scopally inert and, in particular, since

³⁵Yanovich casts his observation in terms of the context in which the presupposition triggered by the pronoun *accommodate*. Let c_0 refer to the global context in which a given sentence is uttered. In this (Stalnakerian) framework, the attitude verb ‘believe’ creates an auxiliary (local context) c_1 of possible states of affairs (‘doxastic alternatives’) compatible with Watson’s beliefs. Since Watson believes that the victim was murdered, at every world in c_1 (at every one of Watson’s doxastic alternatives), there is a unique woman who murdered the victim.

(a) (a_1) Watson believes that (c_1) she used poison.

Yanovich observes that the presupposition that the murderer is female can be accommodated *globally* i.e., in c_0 , or *locally*, in the embedded context, c_1 . When the presupposition is accommodated globally in c_0 , (a) presupposes that the murderer is female. When it is accommodated in the local context c_1 (in the scope of ‘believe’), the weaker presupposition that projects is that Watson believes that the murderer is female.

Since it is controversial whether there is such a thing as local accommodation (see von Stechow 2008), I have cast the discussion in terms of *projection* (rather than local accommodation) properties.

they can displace to the subject of an attitude verb, these implications are also not – across the board – wedded to the perspective of the speaker (more broadly, to the context of report), in the way that conventional implicatures are. Whereas conventional implicatures steadfastly remain speaker commitments, the implications associated with certain features need not reflect the perspective and commitments of the speaker.

According to Potts, the scopal independence and speaker-orientedness of expressives like ‘damn’ “tells against an assimilation of expressives to presuppositions” and instead support a conventional implicature-based analysis (2006, 7). By the same token, the contrasting observations concerning features tell *against* their assimilation to conventional implicatures.³⁶

2.3.3 Scope interactions

One conclusion to draw from the observation that pronominal features can take narrow scope relative to quantifiers and other operators is that there *are* some natural language operators that operate on character (‘monsters’), shifting parameters of the contextual assignment function in the coordinates that supply pronouns with their values. The main difficulty with this conclusion is the one Kaplan observes (1989a, 510-512): if non-factive attitude verbs, certain adverbial quantifiers, etc., can operate on the contextual assignment function in the coordinates that pronouns depend on, then there should be other operators (like Kaplan’s ‘in some context’ operator) which operate on the contextual assignment function, shifting the coordinates that *1st and 2nd person pronouns* depend on.

³⁶ This is particularly clear if we adopt Potts’ semantic analysis of conventional implicatures. Potts’ semantics is designed to capture the scopal invariance of conventional implicatures and indeed to predict that conventional implicatures are “logically and compositionally independent of what is said (in the favored sense)” (2006, 7). Conventional implicatures and at-issue meanings are said to belong to mutually exclusive semantic types, with their own composition rules, and are thus specifically defined in such a way as to prohibit the kinds of interactions we find with respect to feature meanings. For example, in the case of expressive, Potts introduces the expressive type \mathbf{E} , which forms the limited class of functional types specified with this clause:

If σ is a descriptive type, then

$\langle \sigma, \mathbf{E} \rangle$ is an expressive type.

(Analogous clauses are defined for other subtypes of conventional implicatures.) The important feature of this definition is that \mathbf{E} is an *output* type. Though Potts has complex types like $\langle \langle \langle e, t \rangle, t \rangle, \mathbf{E} \rangle$, they are all of the form $\langle x, \mathbf{E} \rangle$, where \mathbf{E} is Potts’ basic expressive type. Potts observes that in order to have interactions between expressives and components of at-issue meaning “there must be a function f (an operator, quantifier, etc) that applies a function of the expressive type. However, there cannot be such a function, since it would map expressive meanings to non-expressive meanings, and there are (by definition) no such functions” (ibid).

However, all our examples of ‘shifted’ interpretations of pronominal features involved 3rd person pronouns. As many authors have observed, it is a striking fact (about English) that we do not find shifted interpretations of 1st and 2nd person pronouns in similar (or indeed, any) constructions.³⁷

A more conservative way to accommodate the (limited) scope interactions between features and operators, which does not open the floodgates to unattested monstrous operators, is to distinguish genuinely indexical pronouns like 1st and 2nd person pronouns from ‘fake’ indexical pronouns like 3rd person pronouns.

According to a traditional view, 1st and 2nd person refer to the speaker and the addressee, while 3rd person pronouns indicate that the referent is the topic of speech.

[First, second and third person pronoun are terms] denoting or indicating respectively the person speaking (first person), the person spoken to (second person), and the person or thing spoken of (third person). (Jespersen 1924, 212)

Many contemporary semanticists argue that the semantics of 3rd person pronouns is considerably weaker than this. For example, Heim (1991) and Sauerland (2008a, 2008b) (see also Sauerland et al. 2005; Schlenker 2003a, 2012) propose that 3rd person features are not associated with true semantic presuppositions and instead trigger purely pragmatic, *implicated* presuppositions.

The idea of an implicated presupposition is that it is derived like an implicature, but in the presuppositional domain. The relevant type of implicature is a *scalar* implicature, of the kind we saw in §2.2.2.

(51) John did some of his homework.

Scalar implicature: John didn’t do *all* his homework.

(52) I saw John or Sue in class.

Scalar implicature: I didn’t see *both* John and Sue in class.

Sauerland assumes (following Horn 1972) that scalar implicatures are based on pre-existing lexical scales (‘Horn scales’), where alternatives or scale-mates are ranked according to informativeness

³⁷ ...in English, at any rate (although some authors argue that free indirect discourse and the historical present make use of monstrous operators; see Sharvit (2004)). As earlier noted, some authors maintain that other natural languages do make use of monstrous operators.

(Matsumoto 1995). A stronger alternative must be more informative than a weaker one. For example, the quantitative scales relevant to deriving the implicatures of (51) and (52) are:

- a. {some, all}
- b. {or, and}

Speakers are obliged (by the maxim of quantity) to select the statement involving the stronger alternative. Thus if a speaker selects a statement with a *weaker* alternative, the hearer is entitled to infer that the speaker believes or knows that the statement with the stronger alternative does not hold. Consequently, an utterance of (51) or (52) will generate an inference (conversational implicature that) the corresponding statements involving the stronger alternative items are false (or that the speaker does not know them to be true).

In order to derive the presuppositions contributed by 3rd person features as implicated presuppositions, Sauerland assumes (following Heim 1991) that the Gricean maxim of quantity operates the level of presupposition.

Maximize presupposition: Make your contribution presuppose as much as is possible!

According to Maximize Presupposition, when faced with a choice between uttering one of a pair of sentences S and S' , where S is associated with a stronger (i.e. more informative) *presupposition* than S' – but the two sentences are otherwise equivalent (or else equally serve conversational aims) – a speaker ought to maximize presupposition by uttering S .

Suppose that John wishes to convey that he is thirsty. According to Heim and Sauerland, Maximize Presupposition requires that John not use ‘he_i’ to refer to himself, since he could use ‘I_i’ instead. Why? Because the presupposition associated with (53) is stronger i.e. more informative than the one associated with (54). (54) presupposes that $g_c(i)$ includes the speaker of c . By contrast, (54) is associated with the weaker (i.e. less informative) implication that the referent of the pronoun is someone or other distinct from the speaker or addressee of c .

(53) I_i am thirsty.

(54) He_i is thirsty.

Since speakers are expected to chose the pronoun which generates the strongest presupposition – to maximize presupposition – a speaker’s choice of a 3rd person pronoun will generate an implicated presupposition that the referent does not have the property or properties which would make a pronoun with stronger requirements on reference appropriate i.e. that $g_c(i)$ does not include s_c (or a_c). However, if, in simply electing *not* to utter (53), a speaker *already* conveys that $g_c(i)$ does not include s_c (or a_c), then this presupposition does not need to be *semantically* associated with the pronoun ‘he’. 3rd person pronouns do not need to lexically encode the information that their referents do not include s_c or a_c at all.

As Sauerland and Heim observe, this view – that 3rd person features do not semantically encode the information that the referent of the pronoun does not include s_c or a_c – resolves a difficulty for traditional accounts of the semantics of the 3rd person feature represented by lexical entries like this one from §2.1.1:

$$[[3^{\text{rd}}]]^c = \lambda x: x \text{ is a salient entity and excludes } s_c \text{ and } a_c. x$$

As Heim (2008, 41-42) observes, the problem with this view of the semantics of 3rd person features is that 3rd person pronouns *can* refer to or range over a set of a values that includes s_c or a_c , as examples like (55) and (56) illustrate.

Someone will have to present the assigned reading in class today.

(55) Whoever it is, he had better be prepared.

(56) Everyone hopes it won’t be himself.³⁸

³⁸Sauerland extends the implicated presuppositions analysis to plural and masculine features in order to account for the fact that plural pronouns can (while singular pronouns cannot) refer to either an individual or a group (cf. (a) *vs.* (b)), and that masculine pronouns (traditionally) can, while feminine pronouns (traditionally) cannot, refer to persons whose gender is unknown (cf. (c) *vs.* (d)),

Context: The speaker does not know whether one person or several were over at John’s last night, or the gender of his guest(s):

John had a party last night...

I’m not sure if more than one person went over...

a. ...but whoever they were, *they* left a mess.

b. ? ...but whoever he was, *he* left a mess.

Just one person went over....

It is not impossible for (55) and (56) to be uttered by or addressed to a member of the same set of students being talked about (a continuation like ‘including me (and you)’ does not sound infelicitous). The proposal that the 3rd person feature does not encode a semantic presupposition (that it denotes an unrestricted identity function) accounts for this observation.³⁹

The important point for present purposes is this: If 3rd person is the unmarked case (i.e. if it does not trigger a semantic presupposition), then 3rd person pronouns carry no person feature that semantically links the pronoun’s value to a parameter of the utterance context. This view is a departure from Kaplan’s account of 3rd pronouns, according to which they are a species of indexical:

I tend to describe my theory as ‘a theory of demonstratives,’ but that is poor usage... The group of words for which I propose a semantical theory includes the pronouns *I, my, you, he, his, she, it*; the demonstrative pronouns *that, this*; the adverbs *here, now, tomorrow, yesterday*; the adjectives *actual, present*; and others. ... What is common to the words or usages in which I am interested is that the referent is dependent on the context of use and that the meaning of the word provides a rule which determines the referent in terms of certain aspects of the context. The term I now favor for these words is ‘indexical’. (1989a, 490)

On this view, 3rd person pronouns are *true demonstratives* – genuine indexicals like the (pure) indexical pronouns ‘I’ and ‘you’ in that they are associated with “a rule that determines the referent in terms of certain aspects of context”. The difference is that true demonstratives originate with ‘incomplete’ characters that are completed by a “demonstration: typically...a... presentation of a local object discriminated by a pointing”:

Some of the indexicals require, in order to determine their referents, an associated demonstration: typically...a... presentation of a local object discriminated by a pointing. These indexicals are the true demonstratives and *that* is their paradigm. ...[In] contrast [for] pure indexicals *no associated demonstration is required, and any demonstration supplied is either for emphasis or is irrelevant*. Among the pure indexicals are *I, now, here* (in one sense), *tomorrow*, and others. ...[e.g.] the speaker refers to himself when he uses *I*, and no pointing to another or

c. Whoever it was that went over, *he* left a mess.

d. ? Whoever it was that went over, *she* left a mess.

³⁹ A more familiar explanation of the comparative ‘unshiftability’ of 3rd person pronouns is that their references depend on the referential intentions of the speaker rather than parameters of context that are fixed independently of speaker intentions. One difficulty with this view is that it does not extend to bound occurrences of 3rd person pronouns. Speaker intentions do not fix the range of values that a bound 3rd person pronoun ranges over (expect, perhaps, inasmuch as they fix the domain of the quantification). Nor does this view extend to shifted interpretations of 3rd person pronouns under intensional operators like ‘believe’, unless speakers can have reference-fixing intentions directed at mere possibilities (and have those intentions satisfied). Instead, it seems natural to explain the fact that the references of 3rd person pronouns depend on speaker intentions by adverting to the (explanatorily prior) fact that they do not semantically encode dependence on contextual parameters.

believing that he is another or intending to refer to another can defeat this reference. (ibid)

According to Kaplan, once the incomplete character of a true demonstratives is completed by a demonstration, the demonstrative functions like an ordinary indexical. By contrast, the alternative view that 3rd person pronouns are *not* genuine indexical pronouns (carry no semantic features linking their values to the utterance context) supplies an explanation of the narrow scope-taking behavior of 3rd person pronouns in contrast with 1st and 2nd person pronouns. 1st and 2nd person pronouns must be interpreted in the utterance context because they are semantically associated with features that link their values to the utterance context. 3rd person pronouns, however, are not so constrained. They only have *descriptive* gender and number features – but no semantic features linking their values to the utterance context. Consequently, there is no *semantic* reason that their values cannot disassociate from the utterance context and enabling the pronoun to be interpreted in the scope of a quantifier or other operator.

2.3.4 Phi-features: A pragmatic account

In the previous section, we saw some initial evidence that the implications associated with phi-features are not scopally inert like conventional implicatures, and engage in limited interactions with certain kinds of operators, including adverbial quantifiers and attitude verbs like ‘believe’. We also saw that there is a natural way to accommodate these observations without introducing a range of ‘monstrous’ context-shifting operators. In particular, we observed that since scopal interactions seem primarily to take place with 3rd person pronouns, it is natural to explain these interactions as a function of the weak semantics of the 3rd person feature. For example, on the *implicated presuppositions* analysis of the 3rd person feature, 3rd person pronouns do not have meanings that wed their interpretations to the utterance context, and so it natural to expect that certain operators can operate on these pronouns.

Once we admit that certain phi-features contribute purely pragmatic contents like implicated presuppositions, it is natural to wonder whether the other features can be treated similarly. Of

course, features cannot be uniformly associated with *implicated presuppositions* of the kind proposed for 3rd person features, since implicated presuppositions are derived from lexicalized presuppositions – that is, they require that certain presuppositions be lexicalized in order that other, implicated presuppositions can be derived in opposition to them. For example, the input to the inference that generates the implicated presupposition *that John is not the speaker or addressee*, in (54) (repeated from above),

(54) John: He is thirsty.

...is a semantic fact about the lexical alternatives to ‘he’ – the fact that pronouns with 1st and 2nd person features are semantically required to refer to the speaker or addressee. If 1st and 2nd person features did not lexically encode these requirements, there would be no basis for the pragmatic inference that generates the implicature.

However, even if the implicated presupposition analysis cannot be extended to other pronominal features, a remaining possibility is that a wholly pragmatic analysis of some *other* kind can be applied to features – that features are associated with pragmatic values distinct from the kinds we have already considered (namely, implicated presuppositions and conversational implicatures).

One reason that it is difficult to eliminate pragmatic alternatives entirely is that there is considerable disagreement about how the semantics/pragmatics distinction is to be drawn. At the same time, however, one reason that the kinds of scope interactions that we observed in the previous section are important is that they provide a way of resisting pragmatic theories that will be acceptable to a wide variety of theorists – even those with substantially different commitments concerning the distinction between semantic and pragmatic content (and the scope of each).

According to certain theorists, semantic contents are to be identified with the contents that operators operate on: if some content *c* is operated on by some operator of the language, then *c* is semantic content of some kind. Familiar examples of operator-based interactions being taken as evidence for a semantic analysis of some content involve applications of the so-called ‘binding test’. It is uncontroversial that both (57) and (58) are context-sensitive, and that the place where they are

uttered is relevant to their truth conditions. In particular, both sentences are true relative to a context c iff it is raining at l_c (the location of c or some location salient in c).

(57) It is raining.

(58) It is raining here.

Different theorists subscribe to different views concerning how the truth-conditions of sentences like (57) come to be sensitive to the location of the raining event, despite the fact that the sentence contains no overt syntactic argument (e.g. a pronoun like ‘here’ in (58)) that takes the location of the raining event as its value. According to some theorists, the truth-conditions of a truth-evaluable construction, e.g. a sentence S , are determined entirely by composing the semantic values (appropriately relativized to contexts or assignments) of the sub-constituents of S according to stable composition rules. On this ‘semantic’ model of truth-conditional contents (cf. Stanley and Szabo 2000, Stanley 2002), all contributions to truth-conditions, including all contextual contributions “are traceable to elements in the actual syntactic structure of the sentence uttered” (Stanley 2002, 391). On the semantic model, *if* the location parameter is truth-conditionally significant, then it must be supplied by some element of the syntax of (57). Accordingly, either (57) does *not* depend for its truth on whether it is raining at the relevant location, or (57) incorporates some additional syntactic structure that accounts for the location value – a location parameter that is phonologically null but present in the logical form of the sentence.

By contrast, proponents of the competing ‘pragmatic’ model of truth-conditional contents (Sperber and Wilson 1986, Carston 2002, Recanati 2005) argue that there is no need to posit an additional, hidden element in the logical form of (57) that contributes a location value to the proposition expressed. These philosophers and semanticists maintain that much of what we ordinarily think of as being said or asserted or conveyed by utterances of sentences is pragmatic content, supplied by context in the form of *unarticulated constituents*. Following Stanley (2002), an object, property or function is an unarticulated constituent of a proposition expressed by a sentence S iff it is part of the intuitive truth-conditions of S but does not correspond to the semantic value of

any constituent of *S*'s logical form. On this view, the truth-conditions of sentences can depend on parameters that do not correspond to the semantic values of any of their (overt or covert) syntactic elements.

Proponents of the semantic model often appeal to evidence about *binding relations* to show that hidden parameters are represented at some level of linguistic representation – that an alleged ‘unarticulated constituent’ is in fact contributed by an element of syntax. Stanley and Szabo (2000, 243) and Stanley (2002, 368–369) argue that there must be a syntactically realized argument place for a location in the logical form of ‘rain’ because this argument place is *bindable* by quantifiers like ‘Everywhere I go’ in (59).⁴⁰

(59) Everywhere I go, it is raining.

(For every place *x*, if I go to *x*, then it is raining at *x*.)

The idea behind this test is that if it can be shown that the interpretation of the embedded clause in (59) depends on the quantifier ‘everywhere’, then this dependence must be explained by the presence of a hidden variable associated in the embedded clause which is semantically and syntactically bound by the quantifier. But, if there is a variable associated with the occurrence of “It is raining” in (59), then (according to Stanley and Szabo) there must be a variable corresponding to a syntactic element of the sentence which is also associated with its unembedded occurrence of in (57).

There is considerable disagreement concerning the adequacy of the binding test. Some authors resist the claim that if there is a bindable variable in the embedded clause in (59), then there must be a bindable variable in (57) (Recanati 2004, Rett 2006). Meanwhile, proponents of the pragmatic model reject the assumption that the binding test is founded on: that binding interactions must be interactions with syntactically realized elements – hidden but bindable variables in the logical forms

⁴⁰ The binding argument originates with Partee (1989), who cites Mitchell (1986). Partee (2009a) notes that semanticists rarely advocate covert pronoun analysis of the kind advocated by Stanley and Szabo. At the same time, she also notes:

Formal semanticists are quite uniformly convinced that the Pragmatic Enrichment Approach cannot be right, because it does not predict any purely linguistic constraints on possible enrichment, and there are indeed strong anaphora-like constraints on what is possible. (Partee 2009a, 8)

(See Marti 2006 for further references and discussion.)

of sentence like (59). Contextual effects on truth-conditional contents are not limited, on this view, to supplying fixed contextual parameters, like the location parameter for (57), and extend to supplying unarticulated constituents *in the form of bindable variables*.

For our purposes, the disagreement between pragmatic and semantic theorists is less important than the common ground between the views. Both semantic and pragmatic theorists take for granted that if a truth-conditionally significant content *is* the value of a syntactically realized element, then it is part of the semantic content of the sentence. The proponent of the semantic modal obviously accepts this — but, crucially, so does the proponent of the pragmatic model. In arguing against the binding test, for example, the proponent of the pragmatic model aims to show that the location parameter for sentences like (57) and (59) need not be contributed by an element of syntax in order to obtain the relevant readings, and concludes *on that basis* (on the basis of the fact that the location of the raining event need not be supplied by an element of syntax) that the binding test does not show that the logical form of (57) and (59) includes reference to the location(s) of the raining event(s). The pragmatic theorist implicitly accepts that if there *were* evidence that the location value is contributed by some syntactically realized constituent of the sentence, there would then be grounds for maintaining that the location value is part of the semantic content of the sentence. The debate between the proponents of each type of view, in other words, concerns whether bindable, truth-conditionally significant contents must be syntactically realized *and therefore semantically significant*, and not over whether syntactically realized, bindable and truth-conditionally significant contents are semantically significant.

Pronouns and their features are, of course, syntactically realized elements, in contrast with the covert elements posited in sentences like (57) and (59). Unlike hidden variables, which have few semantic or pragmatic properties beyond being fixed by context and susceptible to binding, the presuppositions triggered by features have complex syntactic and semantic properties. The dispute over the semantic significance of features is therefore of a quite different nature than the dispute over the semantic significance of the element that supplies the location that the truth-conditions of

(57) depend on – and is independent of how debates about the adequacy of the binding test are resolved. The challenge in cases like (57) is to provide evidence of the *syntactic reality* of some interpretatively significant element – to show that the element that contributes a location to the interpretation of the sentence is syntactically realized. In contrast, the challenge in the case of phi-features is to show the *interpretative significance* of a syntactically real element – to show that the syntactically real elements corresponding to pronominal features interact with operators, thereby contributing in more ways than is generally been appreciated to interpretations of sentences. Of course, there is a position in logical space according to which some pragmatic contents corresponding to the values of syntactically realized elements contribute contents that interact with operators in the way that the implications associated with features do. However, it is hard to see much by way of interest or motivation in such a view.

2.3.5 Why phi-features do not contribute pre-assertoric contents

An additional reason to be skeptical of (at least some) pragmatic theories of the contributions of phi-features involves the fact that features play a reference-fixing (more generally, value-determining) role. On a Gricean model of the semantic/pragmatics interface, pragmatic contents are *post*-propositional contents arising via inferences, the input to which is the fact that a speaker has uttered a sentence with a certain semantic content. By contrast, features make a *pre*-propositional contribution. They determine the *input* to the proposition expressed.

In this section, I consider whether this pre-propositional role is *itself* at odds with the view that features make a semantic contribution. I ask whether phi-features should be associated with extra-semantic contents in the form of *pre*-semantic contents of some kind.

One problem with standard definitions of semantic presupposition is that they fail to distinguish semantic presuppositions, on the one hand, and various kinds of pre-semantic definedness conditions, on the other. Consider the following ‘Standard Logical Definition of Presupposition’ from Burton-Roberts (1989; citing van Frassen 1968):

A presupposes B if and only if:

- a. wherever A is true, B is true *and*
- b. wherever B is not true, A has logical status other than true or false.

The worry is that this definition is too liberal – *too much* gets counted as a semantic presupposition.

For example, let A be an arbitrarily chosen sentence and B be some sentence like:

“ A ’ is truth-evaluable”

“Snow is white iff snow is white”

“ $2+2 = 4$ ”



“There are no irresolvable ambiguities in this very sentence”.

...

None of these examples conform to the intuitive notion of a semantic presupposition, yet each of them satisfies Burton-Roberts’ criteria for semantic presupposition. For example, let B be the sentence “ A ’ is truth-evaluable”. B will be true whenever A is true (and therefore truth-evaluable). Furthermore, since B asserts that A is truth-evaluable, since whenever B is not true, A will have logical status other than true or false. Likewise, let B be the tautology “Snow is white iff snow is white”. Since a tautology is a classical consequence of every sentence whatsoever, B is true whenever A is. Moreover, the conditional requirement, *that A have logical status other than true or false if B is not true*, is also (trivially) satisfied, since there are no circumstances that witness the truth of the antecedent. Similar remarks apply for the other examples.

Although particular examples may be negotiable,⁴¹ it seems clear that there are *some* conditions on the truth-evaluability of sentences that do not derive from semantic presuppositions. For example, Heim and Kratzer (1998, 81) observe that there is an intuitive distinction to be drawn

⁴¹ For example, some proponents of pragmatic models of presupposition (according to which presuppositions represent ‘what is taken for granted by speakers’) may be willing to count tautologies as presuppositions of every sentence whatsoever. Beaver (2008) observes,

Some have argued that this [(having tautologies be *entailments* of every sentence whatsoever)] is not a desirable property for entailment (and that what is needed is a notion of *relevant* entailment). But it is not clear whether it is an undesirable property for logics of presupposition: to the extent that such systems model what is taken for granted by speakers, it might be seen as natural that tautologies are presupposed.

However, even if tautologies are taken by pragmatic theorists to be presuppositions, it is not clear that the pragmatic theorist should regard them as *semantic* presuppositions (on pragmatic views: elements of the distinguished class of pragmatic presuppositions tied to the lexical meanings of sentences).

between semantic presupposition failures like (61) (where there is no escalator in South College) and truth-value gaps that result from Θ -Criterion violations like (60).

(60) Anne laughed Jan.

(61) The escalator in South College is moving

Θ -Criterion violations occur when a construction is not in the domain of the interpretation function as defined by semantic theory – when, for example, some argument place in the logical form of a verb is not supplied a value, or a value of the right kind.

As Heim and Kratzer observe, standard definitions of semantic presupposition do not distinguish the two kinds of failures, yet they “are obviously quite different intuitively, and by simply conflating them we would be missing a systematic fact about people’s linguistic intuitions” (1998, 80-81). They consider (and reject) an alternative criterion for semantic presupposition that distinguishes semantic presupposition failures from Θ -Criterion violations on the basis of whether it is provable from the semantics alone that a construction is uninterpretable – or whether, as in the case of (61), “we need to invoke physical facts to show [that (61) lacks a denotation], and we can easily imagine counterfactual states of affairs in which this sentence *would* have a truth-value” (ibid).

If α is *uninterpretable*, then it can be proved from the semantics alone that α is outside the domain of [[]]

If it is a contingent matter of fact that [some sentence] α is outside the domain of [[]], then α is a *presupposition failure*. (Heim and Kratzer (1998, 81)

The difficulty, they observe, is that the corresponding biconditionals cannot stand as definitions of uninterpretability and presupposition failure:

α is *uninterpretable* iff it can be proved from semantics alone that α is outside the domain of [[]]

α is a *presupposition failure* iff it is a contingent matter of fact that α is outside the domain of [[]].

The problem with these revised criteria is that sentences like “John met the man who died and didn’t die” will be indistinguishable from (60) in that “we only need the semantics of English in order to infer that it has no semantic value. But its intuitive status is different, and it should be classified as a

presupposition failure rather than as uninterpretable” (on the grounds that the sentence presupposes the false proposition *that there exists a unique man who died and did not die*) (ibid).

Like Heim and Kratzer, I will leave open how this important problem is to be solved – what, precisely, the individuating, necessary and sufficient conditions for semantic presupposition are.⁴² The point to note is simply that there *is* a conceptual gap between semantic presuppositions and pre-semantic definedness conditions of various kinds. Moreover, this gap might appear to be particularly threatening on the Cooper analysis for the reason earlier noted: features play a pre-propositional role, and in this respect more closely resemble *pre-semantic* conditions.

A related line of objection is developed in recent work by Stokke (2011). Stokke argues against the view that features are associated with *semantic* contents on the grounds that features help the audience recover the truth-conditional contents of pronouns (what Stokke, following Stalnaker, calls their ‘assertoric contents’).

I take it as *datum*... the information contributed by the phi-features serves as a crucial aid for the audience in their attempt to recover what the speaker intended to refer to with a particular use of a pronoun. Consequently, feature information helps the audience establish the assertoric, or truth-conditional, content of the utterance. (2011, 93)

Stokke claims that feature information diverges in this respect from the information contributed by standard semantic presupposition triggers like aspectual and factive verbs, cleft constructions and definites.

- (62) Aspectual verbs: John stopped drinking.
Asserts: John stopped drinking.

⁴² We are left with the following *necessary* – but not sufficient – condition on *p* being a presupposition of *S*:
p is a presupposition of a sentence *S* if an utterance of *S* in a context *c* is true or false only if *p* is true in *c*

The question is what the further condition or conditions are, the obtaining of which is *sufficient* for *p*’s being a semantic presupposition of *S*.

As I note in the main text, I will not take up this difficult question. For the purposes of this chapter, I shall take it that it is enough to assume that: if *p* is a condition on *S*’s expressing a truth-evaluable proposition, *p* is a semantic content of *S* contributed by one of its lexical constituents, and *p* is a content that speakers ‘take for granted’ (in an intuitive sense) in asserting *S*, then *p* is plausibly regarded as a semantic presupposition of *S*.

I do not doubt that there are counterexamples to the claim that this cluster of conditions is sufficient for counting *p* as a presupposition of *S*. Here Kripke’s comment on semantic presupposition is apt:

[T]o some degree Justice Stewart’s comment about pornography holds here: we all recognize it [semantic presupposition] when we see it [but] we can’t say exactly what it is. (2009, 1)

The contents contributed by features are not so far from the intuitive conception of presuppositional phenomena that it is reasonable to doubt that they are semantic presuppositions if they possess the cluster of properties indicated above.

Presupposes: John used to drink.

- (63) a. Factive verbs: John realizes that Obama is a Democrat.
b. Asserts: John realizes that Obama is a Democrat.
c. Presupposes: Obama is a Democrat.
- (64) a. Clefts: It was John who stopped drinking.
b. Asserts: John stopped drinking.
c. Presupposes: Someone stopped drinking.
- (65) a. Definites: The current president of the United States is a democrat.
b. Asserts: Obama is a democrat.
c. Presupposes: There is a unique present of the United States.
- (66) a. Pronouns: You are a Democrat.
b. Asserts: John is a Democrat.
c. Presupposes: John is the unique addressee. (Stokke 2011, 13)

According to Stokke, feature information, like the information that referent of the pronoun in (66) is the *addressee*, is “something the audience must pass through in order to recover what the speaker intends to refer to with a particular use of a pronoun” (2011, 93). By contrast, the relationship between the assertoric and presuppositional contents of (62)-(65) “seems to be the opposite of what it appears to be with respect to the case of phi-features” (ibid). The presupposition associated with each of the sentences in (62a)-(65a) – for example, the information *that John used to drink*, presupposed by (62a) – does not help the audience determine the truth-conditional content of the sentence (*that John stopped drinking*). Instead, this presupposition is implicated in the truth-conditional content of the sentence; it arises because “we just do not know what it would be for someone to stop doing something they have never been doing” (2011, 94).

Stokke argues that the role that features play in determining the ‘assertoric’ or propositional contents of pronouns is at odds with their analysis as semantic presuppositions. The contrast between features and standard examples of semantic presupposition triggers shows, he argues, that features contribute *pre-assertoric* content – a position he regards as incompatible with Cooper’s position that features impose semantic conditions on the reference of pronouns.

There are a couple of points to make about Stokke’s argument. The first concerns the nature of the contrast between standard presupposition triggers and phi-features. A better way to frame the

contrast Stokke draws attention to than in terms of the role various presuppositions play *for the audience* in recovering the assertoric content of an utterance, is in terms of the way the two kinds of presuppositional contents relate to the truth-conditional or assertoric contents of sentences. More to the point, it would seem, is the observation that features contribute contents that appear to be largely independent from (and thus can play a role in determining) the assertoric contents of pronouns. One can grasp the truth-conditional content of (66), *that John is a Democrat*, without conceiving of John as the addressee because the latter content is not implicated the former. By contrast, Stokke’s intuition appears to be that one cannot grasp the truth-conditional content of (62a) without grasping the proposition *that John used to drink* – that the presuppositional and truth-conditional contents are somehow bound together. This observation is explanatorily prior to Stokke’s: the independence of the implications associated with features from truth-conditional contents *explains* why features can play the role for the audience that Stokke highlights.

The second point concerns the data itself. One difficulty with Stokke’s generalization concerning ‘standard’ presupposition triggers is that many authors maintain that the presuppositions of definite terms (cf. Stokke’s example (65) of definite descriptions) are *also* pre-assertoric – both in the sense that they are pre-propositional, and in Stokke’s narrower sense.

The following entry for the definite determiner (or notational variants) is standard in contemporary semantic accounts (cf. Heim and Kratzer 1998, von Stechow and Heim 2002, Elbourne 2005).⁴³

$$[[\text{the}]]^{M,g} = \lambda f: \exists!x f(x). \lambda x f(x) = 1 \quad \langle e, e \rangle.$$

⁴³ For example, the semantics of the iota-operator ‘ ι ’ on the treatment of definite descriptions in Heim & Kratzer (1998, Ch. 4.4) is as follows:

If u is a variable of type e and $\varphi \in ME_e$, then $[[\iota u \varphi]]^{M,g}$ is the unique individual $d \in D_e$, such that $[[\varphi]]^{M,g d/u} = 1$. If there is no such individual, $[[\iota u \varphi]]^{M,g}$ is undefined.

Elbourne (2008b, 198), offers the following definition:

The semantics of the metalanguage operator ‘ $\ulcorner \urcorner$ ’ is as follows: for any function f , the denotation of ‘ $\ulcorner \lambda x f(x) = 1 \urcorner$ ’ will be of type e , if it is defined; if there is exactly one entity x such that $f(x) = 1$, the denotation of ‘ $\ulcorner \lambda x f(x) = 1 \urcorner$ ’ will be that very individual; if there is no such individual, the whole expression will have no value.

The definite determiner is associated with a partial function from properties to individuals, defined only for arguments (sets of individuals) whose cardinality equals one. In other words, a computation of the semantic value of the determiner and its argument can succeed only if the argument (the relevant set of individuals) has exactly one member. If it does, then the complex t-expression is a referential term that refers to the unique member of the restrictor set. On the other hand, if the argument is a predicate like ‘state bordering New York’, which denotes a non-singleton set, then the interpretation function, $[[\]]^{M,g}$, does not yield a denotation for the t-expression, and a sentence like (67),

(67) The state bordering New York is famous for is clam chowder.

... will fail to express a proposition that is true or false.

There are two quite different views glossed over by locutions like “does not express a proposition that is either true or false”. According to the first, (67) does not express a proposition p true or false at the actual world and context, but it *does* express a proposition simpliciter – one that is true at worlds w' , w'' , where a single state borders New York. According to the second view, a more dramatic kind of failure occurs: (67) expresses *no proposition at all*.

Disagreement and inconsistency on this point has a long history; in early work, Strawson fails to distinguish between the views just noted. In response to criticisms by Sellars (1954) and Evans (1982), he later (1974) clarified that a use of ‘the F is G ’ will not express a proposition *at all* if the presupposition *that there is a unique F* is false (Soames 1989a, 514). Abbott (2000), Reimer (1998) and Schoubye (2011), among others, advocate the same position. Schoubye (2011, 9) writes: “if the presupposition fails, the definite description fails to refer, and the sentence as a whole *fails to express a proposition*” (emphasis added). Similarly, Reimer holds that:

...a referential utterance of the form The F is G expresses a singular proposition provided the intended referent satisfies the linguistic meaning (the ‘sense’) of the definite description: provided it is the (contextually) unique. In cases where this condition is not met, a singular proposition may well be communicated, but no proposition (singular or general) will be literally expressed. (Reimer 1998, 93)

On this view, a sentence like (67) will express a singular proposition only if “the intended referent ...

is (contextually) unique”. If not, (67) will not literally (semantically) express a singular or general proposition (though one may be ‘communicated’ through extra-semantic means).

By contrast, Elbourne (2008a) argues that a sentence containing an empty definite description expresses a proposition, but that the truth-value of this proposition is undefined at the world of report (and at other indices of evaluation where its definiteness presuppositions are not satisfied):

- Regardless of the utterance context, [[the ζ] ξ] expresses that proposition which is
- true at an index i , if there is exactly one ζ at i , and it is ξ at i ,
 - false at an index i , if there is exactly one ζ at i , and it is not ξ at i ,
 - truth-valueless at an index i , if there is not exactly one ζ at i .

(Elbourne 2008a, 412; citing Heim 1991)

These two views concerning the denotation – or lack thereof – of sentences containing non-referring definite descriptions correspond to importantly different views of the semantics of definite descriptions themselves. Authors like Elbourne, who maintain that sentences containing non-referring descriptions express propositions (albeit ones that are truth-valueless at the world of report) do not have in mind that sentences containing non-referring terms express sub-propositional objects (‘incomplete propositions’ or ‘propositional skeletons’).⁴⁴ As Elbourne’s account of the truth-conditions of sentence of the form ‘the f is g ’ makes clear, non-referring descriptions are said to lack semantic values in the sense that they lack reference (*extensional* semantic value) but not intension, where the intension of a definite description is an individual concept, a (partial) function from worlds to individuals (cf. Church 1943, Carnap 1947). Singular terms refer only indirectly to actual objects, via these intensions. Although the intension denoted by the ‘the state bordering New York’ does not have an instantiation (extension or reference) in the actual world, it does have one at a world where there is a single state that borders New York. Consequently, a sentence like (67) will denote the proposition p which is *true* at a world w if there is a single state s bordering New York at w and s is

⁴⁴ On some views, the semantic value of a sentence which does not express a complete truth-evaluable proposition at a circumstance of evaluation because some argument has not been supplied expresses a *sub-propositional* semantic object – a content which is not fully propositional, but something like a propositional fragment or skeleton that needs to be supplemented with certain values (Bach 2005, 2007; Kroening et al 2008).

famous for its clam chowder, *false* at w if there is a single state s bordering New York at w and it is *not* famous for its clam chowder, and undefined at w if there is no – or no single – state bordering New York. On the alternative view, empty definite descriptions do *not* express propositional contents, making *no* semantic contribution to the proposition expressed by a sentence whatsoever, their *non*-empty counterparts are effectively constant terms, which refer to the unique elements of their restrictor sets.

Which of these views we take bears on the question whether definite descriptions contrast with pronouns in the way that Stokke indicates. If definite descriptions refer to individuals, then the presuppositions they trigger are every bit as ‘pre-assertoric’ as the presuppositions triggered by pronouns, since their definiteness presuppositions must be satisfied for an assertoric or truth-conditional content to be secured in the first place. Moreover, they will also be pre-assertoric in Stokke’s sense that they can be grasped prior to and independently of the assertoric content of the description. For example, one can grasp the truth-conditional content of Stokke’s (65) – on this view, the singular proposition *that Obama is a Democrat* – without conceiving of Obama as unique individual who is president of the United States.

By contrast, on the view that the denotations of definite descriptions are individual concepts, there *is* a difference between the presuppositions triggered by definite descriptions and those that Cooper associates with phi-features. This difference, however, would not show that pronouns do not trigger semantic presuppositions.

Here we need to distinguish between two traditional notions of semantic presupposition. On the one hand, there are *expressive presuppositions*, often taken to include referential presuppositions but also those introduced by indexical presupposition triggers like ‘too’ and ‘also’. On the other, there are *logical presuppositions*, which can arise in a variety of ways – triggered by lexical meanings, for example, or certain syntactic constructions (e.g. clefts). Although both presupposition of both kinds have been motivated using examples in which the truth of a proposition is necessary for a use of an expression to secure a referent or denotation, they are conceptually distinct. Logical presupposition is “a

relationship between (gappy) propositions, which describes when a proposition has a truth-value” (Glazberg and Siegel 2004, 17). By contrast, the Strawsonian notion of an expressive presupposition is that of a precondition for a sentence to express a proposition:

A sentence *S* *expressively presupposes* a proposition *p* relative to a context of utterance *c* iff the truth of *p* is necessary for *S* to semantically express a proposition in *c*. (Soames 1989a, 562)

This, of course, is precisely the distinction between the two conceptions of the role of definiteness presuppositions that we have been concerned to draw.

As Soames (1989a, 561-562) notes, one of the reasons Strawson may have had difficulty distinguishing these two kinds of semantic presupposition is that the distinction is best cashed out in two-dimensional semantic frameworks – of the kind that only later emerged in Kaplan (1989a/b). In two-dimensional semantic frameworks, the two kinds of presupposition can be distinguished by their roles at different stages of semantic evaluation: At the first stage, a sentence is associated with the proposition it expresses at a context. The semantic mechanisms responsible for this are what give rise to expressive presuppositions, which need to be satisfied at the context of interpretation in order for a sentence to be assigned content (a proposition). At the second stage, this content is evaluated for truth or falsity at a circumstance of evaluation. This semantic mechanism for determining the extensions (referents) presented by propositions and their various constituents are what give rise to logical presuppositions. Logical presuppositions must be fulfilled in order for a sentence to be either true or false at an index.

The main upshot is that the observation that feature information is pre-assertoric does not show that the analysis of phi-features as presupposition triggers is mistaken. At most, what it suggests is that features trigger *expressive presuppositions* – along with, perhaps, definite descriptions (the *original* presupposition triggers) and other referring terms.

Of course, we can then ask whether expressive presuppositions (either as a class, or those associated with features) are *themselves* semantic presuppositions. Again, the natural alternative is a pre-semantic theory, since the requirements associated with features (and expressive presuppositions more generally) must be satisfied *before* a denotation can be assigned to an expression.

2.3.6 A more general problem for pre-assertoric accounts

To begin, it will be helpful to get a bit clearer on what we mean when we say that some content or other is ‘pre-semantic’ in character. According to one influential view (Davidson 1973, Perry 1997), *pre-semantics* is primarily concerned with the disambiguation of expressions. Ivan Sag (as reported in Perry 1997, 593) provides the following examples of *pre-semantic* context-dependence:

(68) Ich! (said by several teenagers at camp in response to the question, “Who would like some sauerkraut”).

(69) I forgot how good beer tastes

With (68), Perry observes, knowing that sentence was uttered in Frankfurt rather than Boston will help audiences determine whether (68) is an expression of enthusiasm or disgust. In the case of (69), knowing whether the speaker has arrived from Belgium or Saudi Arabia will help determine both the interpretation and syntactic structure of the sentence (whether ‘good’ modifies ‘beer’ or ‘tastes’). On this view, presemantics is primarily concerned with matching semantic types to tokens: with identifying the semantic types of tokens that have the same phonetic properties (e.g. ‘I’, ‘eye’ or ‘aye’) or the same graphemic properties (e.g. ‘bank’, ‘bat’ or ‘ball’). A token is ‘pre-semantically context dependent’ if it is a token of an *orthographic* (phonetic or graphemic) type that is ambiguous between different *semantic* types of expression.

The proposal that phi-feature play a (solely) pre-semantic role amounts to the claim that the role of features is exhausted at the stage at which a token is assigned the semantic type of a pronoun. This view is rejected by Perry (1997), who observes that indexical pronouns are paradigms of *semantic* context-dependence:

Sometimes we use context to figure out which meaning a word is being used with or which of several words that look or sound alike are being used, or even which language is being spoken. These are presemantic uses of context. In the case of indexicals, however, context is used *semantically*. It remains relevant after the language, words and meaning are all known; the meaning direct us to certain aspect of context. (1997, 593)

There are a number of compelling reasons to reject the pre-semantic model of the context-dependence of pronouns. One of these involves word-individuation. If some token *t* is not assigned

a semantic type T in a context c , then t does not have reference or denotation in c . Similarly, features impose requirements on the reference or denotation of pronouns. However, the similarities end there. If a speaker utters,

(70) She is the only woman in this room.

...pointing to John, then although the speaker does not refer to John, the semantic type of the token is determinable. The token does not lack reference because it is an uninterpretable bit of syntax – a meaningless string, without semantic type. Instead, the token cannot be assigned reference precisely *because* the semantic type of the token is in fact determinable – and tokens of that semantic type are associated with conditions that exclude it from referring to the speaker’s intended referent.

Similar problems arise for the suggestion that the role features play in determining the references of pronouns belongs to an account of the *meta-semantics* of pronouns rather than to their semantics proper. According to Kaplan (1989b) and Stalnaker (1997), the role of semantics is that of assigning semantic values to constituents (a job which may require input from pragmatics, in the case of context-dependent constituents). By contrast, the role of meta-semantics is to explain how constituents end up having the semantic values they do.

The fact that a word or phrase *has* a certain meanings clearly belongs to semantics. On the other hand, a claim about the *basis* for ascribing a certain meaning to a word or phrase does not belong to semantic. ‘Ohsnay’ means *snow* in Pig-Latin. That’s a semantic fact about Pig-Latin. The *reason* why ‘ohsnay’ means *snow* is not a semantic fact; it is some kind of historical or sociological fact about Pig-Latin. (Kaplan, 1989b, 573)

We might gloss the difference by saying that meta-semantic questions are addressed to questions concerning *how* or *why* expressions have the semantic values they do, rather than questions concerning *what* the semantic value of an expression is. Answers to these how and why questions can cite foundational facts in the theory of meaning (‘because of the way that meaning supervenes on use’, or ‘because meaning is determined by external factors’) or etymological facts (concerning the derivation of ‘Madagascar’ or ‘quarantine’⁴⁵), or facts about how entire classes of expression are

⁴⁵ For example, it might be part of a metasemantic account of how ‘Madagascar’ came to mean Madagascar that the name arose from a “hearsay report of Malay or Arab sailors misunderstood by Marco Polo ... [which] had the effect of transferring a corrupt form of the name of a portion of the African mainland to the great African Island”, or that ‘quarantine’ derives from the French ‘quarante’ (forty),

assigned semantic value. For example, on a classic direct reference theory of proper names, all there is to the semantic value of a name is its bearer. Causal historical theories of the kind that Kripke (1972) proposes are answers to meta-semantic questions concerning *how* a name receives its semantic value (its reference).

Might pronouns be like proper names, in that it is a *metasemantic* question how a (referential) pronoun acquires its reference in context? On this view, the semantic value of a pronoun would be exhausted by its reference – the rules that tell us how the referent of the pronoun is determined would be part of a story about how the pronoun comes to have the semantic value (reference) it does. As Kaplan observes, the immediate difficulty with the view that “that character [(or more generally: the reference determining content of indexicals, however conceived)] belongs to metasemantics” is that:

...one would have to regard indexicals as systematically ambiguous and as having no meaning at all outside a particular context of use. ... [I]t is decidedly implausible for indexicals... (1989b, 574)⁴⁶

Kaplan’s point is related to the earlier objection to *pre-semantic* treatments of pronominal features: To argue that character belongs to metasemantics, one would have to regard indexicals as being systematically ambiguous (without semantic type) outside a context of use.⁴⁷ As a consequence, any

referring the number of days that a ship’s passengers were required to wait before making contact with the shore, etc (Isaac Taylor, *Names and their History*, 1898).

⁴⁶ There is also, Kaplan notes,

... the fact that there is a *logic* of indexicals, a logic whose semantically valid arguments deviate from the classically valid. This in itself seems to argue that the mechanism by which directly referential expressions determine their referents belong to the semantics. (1989b, 575)

According to Kaplan, “[o]ne need only understand the meaning of [(a)] to know that it cannot be uttered falsely” (Kaplan 1989a, 509).

(a) I am here now.

A few paragraphs later, he claims that theory which cannot represent the validity of (a) has “missed something essential to our understanding of indexicals” (Kaplan 1989a, 509).

However, as arguments for the semantic significance of contents go, Kaplan’s appeal to the ability of competent speakers to recognize indexical validities is rather weak – despite the important role that it plays in motivating his semantics. It is not at all clear that a competent speaker must be in a position to appreciate the ‘indexical validity’ of a sentence like (a). For example, some semanticists who are competent speakers of English hold that there are English-language monstrous operators capable of shifting parameters of context in the coordinates that supply indexicals their values. On the view that there are such operators, and that they are capable of shifting (one at a time) the parameters of the context *c* relative to which (a) is interpreted, (a) can express a *false* proposition. Thus, someone who is committed to the existence of such operators would *not* recognize the indexical validity of (a). Surely, however, such a theorist counts as a *competent* user of indexicals.

⁴⁷Elbourne (pc) observes that one might object that a token of ‘Aristotle’ *does* have semantic type even

token that failed to refer would be semantically typeless. Then we have no explanation of *why* e.g. ‘she’ could not refer to John, since we could not appeal to semantic requirements on the (typeless) token prohibiting that assignment of reference.

By contrast, the view that the facts about how the reference of a proper name is determined are metasemantic facts is plausible precisely because of the corresponding plausibility of the view that if a speaker does not manage to use a token of e.g. ‘Aristotle’ to name a certain man (e.g. because her token is not appropriately causally related to other tokens belonging to a use of the name ‘Aristotle’), then the speaker’s token is not a token *proper name* at all. Pronouns are unlike proper names (and, perhaps, like definite descriptions) in that their semantic type is independent of their reference.

A final, important difficulty with both pre-semantic and meta-semantic theories of the implications associated with features is that contents of either of these kinds should not interact with operators and quantifiers in the way that the implications associated with features do. Indeed, the scopal interactions we observed in §2.3.2 are, if anything, *better* evidence against pre-semantic theories than they are against pragmatic ones. While there is a position in logical space according to which some syntactically realized elements contribute truth-conditionally significant *pragmatic* contents that interact with operators, it seems to be built into the concept of pre-semantic and meta-semantic content that these contents play a role *prior* to the stage at which semantic interpretation takes place. Consequently, they should not be able to ‘intrude’ upon the compositional semantic processes that determine the semantic contents (perhaps pragmatically enriched) of sentences (or subsentential constructions) that operators operate on. In the following chapter, we will see many more examples of interactions of these kinds.

2.4 Phi-features as semantic presupposition triggers

Aristotle’ has semantic type even if it is not associated with a determinate meaning. For example, the token might be associated with the semantic type of a proper name, even if it is ambiguous (even if it is not resolved whether the token occurs as a name for the philosopher, or the shipping magnate, ...). However, I am assuming here that if a token of ‘Aristotle’ is not hooked up to an existing name using practice, then there is nothing that determines that the token occurs as a token of a proper name, and thus nothing which warrants associating the token with the semantic type of a name.

The main aim of this chapter has been to defend an alternative to the traditional Kaplan-style semantics for pronouns, according to which pronouns are uniformly represented as variables that are associated with presuppositional, feature-based restrictions on their assignments of value. On the one hand, standard truth-value judgment and projection-based tests for semantic presuppositions lend support to the view that the contents contributed by phi-features are presuppositional in nature. On the other, these contents have (or allegedly have) properties that distinguish them from standard examples of semantic presuppositions. For example, they are thought to be logically and compositionally independent of ordinary semantic values – independent of at-issue contents (*pre-assertoric*, according to Stokke) and to exhibit projection behavior that sets them apart from standard semantic presuppositions. Kaplan’s semantics, in particular, is designed to capture their perceived ‘scopal inertness’ – to predict that these contents do not interact with operators in significant ways.

In this chapter, we saw that the argument that phi-features should, on these bases, be assimilated to other kinds of contents – to conversational implicatures or pre-semantic definedness conditions (which the project tests do not rule out) – is flawed from two directions. First, some of the properties that allegedly set phi-features apart from semantic presupposition triggers are not genuinely at odds with a presuppositional analysis. In particular, the observation that phi-features play a reference-determining (or restricting) role (and are in this sense, pre-assertoric) is compatible with their analysis as expressive presupposition triggers, which contribute at the stage at which content is determined at a context, rather than at the later stage of evaluation when contents are evaluated for truth or falsity at an index. Second, phi-features do *not* have certain of the properties that allegedly set them apart from other semantic presupposition triggers. Of particular importance is the observation that phi-features do not contribute contents that are *scopally inert* in the way that it has been standard to maintain – that these contents *do* interact with operators in significant ways. If indeed this latter point can be maintained, this is strong evidence that phi-features *do* contribute semantic presuppositions, as opposed to conventional implicatures or pre- or post-semantic contents of some kind, and also evidence against the traditional Kaplanian analysis. This evidence is

supplemented in the following chapter, where I argue that the phi-features of pronouns routinely interact in significant ways with operators.

3 Bound Pronouns as Semantic Presupposition Triggers

3.0 Introduction

In the beginning of the previous chapter, a tension was noted between Kaplan’s indexical semantics for *referential* pronouns, on the one hand, and a pair of plausible views concerning the semantics of *bound* pronouns, on the other. The first of these views is that the relation between bound pronouns and their antecedents “*strictly* corresponds” to the relation between bound variables and their binders:

It is very important to notice that the relation of bound variables to the binding operator in symbolism *strictly* corresponds to the relation of pronoun to antecedent in the vernacular. (Geach 1972, 12-13)

The second is that referential and bound pronouns are “not mere homonyms” (Perry 1997, 594). A pronoun like ‘his’ in (1) is “a single unambiguous word, which sometimes functions as a [bound] variable and sometimes as an indexical” (ibid).

(1) Every man loves his mother.

An apparent advantage of Cooper’s semantics is that it is compatible with *both* the view that bound pronouns function as bound variables *and* the view that bound and referential pronouns are not homonyms.

This chapter takes a closer look at the role – in particular, the *semantic* role – of phi-features on bound pronouns.

It is clear that phi-features have *some* role to play on bound pronouns. For example, the bound readings of the pronouns in (2) and (3) are excluded because of the clash between their phi-features and those of their (would-be) antecedents.

(1) Every man_{3rd,sing} loves his_{3rd,sing-masc} mother. (bound/referential)

(2) Every man_{3rd,sing} loves my_{1st-sing} mother. (referential only)

(3) Every man_{3rd,sing} loves her_{3rd-sing-fem} mother. (referential only)

The crucial question is whether the features of bound pronouns are solely present for *syntactic* reasons – whether they are a ‘superficial reflex of agreement’ – or whether they have, in addition, a *semantic* role to play.

[A]re person, number and gender features on bound-variable pronouns semantically interpreted, or are they just a superficial reflex of agreement between the pronoun and its antecedent? (Heim 2008, 35)

In a case like (1), the question is whether the bound reading is available simply because the pronoun ‘his’ *agrees* with the antecedent DP ‘every man’, or because the semantic value of the pronoun is semantically *defined* for every object (every man) in the domain of quantification. Similarly, are the bound readings of (2) and (3) *unavailable* because the values of the pronouns are *not* defined for the objects in the domain of quantification (because every man is not identical to the speaker, or female) or simply because of the lack of agreement?

The natural view is that the phi-features on bound pronouns play a role strictly analogous to the phi-features on referential pronouns – restricting assignments of value to the variables in their logical forms. As Heim observes,

From a theoretical point of view, it would be disappointing to have different analyses of the same features depending on whether they are on deictic or anaphoric pronouns. (2008, 37)

The view that the reference-constraining role of features on referentially used pronouns and the antecedent-constraining role of the features on bound pronouns are traceable to a common source in the semantics of features is the “*null hypothesis*, given that we have had to give a semantic interpretation to features [(those on referential pronouns)] anyway” (Heim 2005, 3; emphasis added).

On the face of it, it is an important advantage of Cooper’s semantics that it unifies bound and referential pronouns under a single semantics. However, one wrinkle in the unification-based argument for Cooper’s semantics is that a variety of authors maintain that the ‘null hypothesis’, despite its naturalness, is *false*: bound pronouns *are* fundamentally semantically different from

referential pronouns in that they lack interpreted features.⁴⁸ Kratzer maintains, for example, that there is a “puzzle of pronominal *ambiguity*” (2006, 2; emphasis added). The puzzle is why bound pronouns “should look the same” as referential pronouns though they are semantically different (because their features are uninterpreted).

The problem with the null hypothesis, according to these authors, is that there seem to be certain cases where the phi-features of bound pronouns would – if they were interpreted – block the derivation of available bound readings of pronouns. These cases are of four main types, illustrated by (a)-(d). In each case, the sentence has an unrestricted quantificational reading, which, it appears, can only be derived if the features of the pronouns do *not* induce restrictions on the values assigned to the pronouns. For example, the feminine and singular features of the bound pronoun ‘her’ in (a) do *not* partialize the domain of quantification to female students or single (i.e. atomic) individuals, in the way that would be expected if these features were interpreted. The natural reading of the sentence is one on which the pronoun ranges unrestrictedly over all relevant homework-doers (e.g. all the other students in Sue’s class: *John, Bill, Elise, ...*), including, perhaps, teams or pairs of students. ((d) raises a strictly analogous problem – along with, as will see, a special set of issues.) Similarly, in (b), the view that the bound pronoun ‘her’ is associated with an interpreted gender feature clashes with independently motivated semantic assumptions about the licensing conditions for VP ellipsis, while the presence of interpreted features on the pronoun ‘they’, in (c), appears to be at odds with the atomicity of the objects (John and Mary, taken individually) that the pronoun ranges over.

‘Only’-DP Cases

(a) Only Sue did her homework.

Paraphrase: Sue did her homework, but no one other than Sue did their homework – I didn’t do my homework, John didn’t do his, Bill and Sue didn’t do theirs, etc.)

Sloppy VP Ellipsis Cases:

(b) Every girl did her homework. Every boy did, too. (= Every boy did his homework.)

⁴⁸Authors who defend some version of the view that the features of bound pronouns are uninterpreted include (but are not limited to) Sag (1976), Partee (1989), Pollard and Sag (1994), Heim (1994, 2001, 2005a, 2005b, 2008), Kratzer (1998, 2006, 2008), Safir (2004), Schlenker (1999, 2002), von Stechow (2001a, 2001b, 2003a, 2003b) and Percus (2006).

Paraphrase: Every girl did her homework, and every boy did *his* homework too.

Dependent readings:

(c) John and Mary each thought they would win.

Paraphrase: Mary thought Mary would win and John thought John would win.

Bound singular indexical (1st and 2nd person) pronouns with ‘truly quantificational’ antecedents

(d) Only I did my homework.

Paraphrase: I did my homework, and no one else did their homework (where there is at least one alternative to the speaker in the domain of quantification).

According to the opponents of the null hypothesis, these cases reveal that bound pronouns do not have interpreted features. Bound pronouns are said either to originate as featureless ‘null’ pronouns, which inherit their features post-semantically from their antecedents, or to originate with interpretable features, which are deleted under agreement *before* semantic interpretation takes place.

The view that bound pronouns are semantically ‘featureless’ variables poses an obvious threat to the unification-based argument for Cooper’s semantics. It would imply, for example, that the descriptive semantic facts are in line with a Kaplan-style semantics, on which referential pronouns are “real, meaning bearing elements of language” (1989b, 593), while the values of bound pronouns are exhausted by their alternate values under varying assignments.

In this chapter, I argue that *there is no ‘puzzle of pronominal ambiguity’*. The phi-features of bound pronouns are interpreted, and play a semantically constructive role strictly analogous to their role on referential pronouns. The argument has two parts. After a preliminary sketch of how the Cooper analysis applies to bound pronouns (§3.1), I argue (§3.2) that cases like (a)-(d) are not counterexamples to the null hypothesis – that they do not involve semantically ‘featureless’ bound pronouns. In each case, there is an alternative, independently motivated way of deriving the ‘featureless’ (i.e. unrestricted quantificational) reading that is compatible with the view that bound pronouns have interpreted phi-features. Consequently, these cases do not threaten the main (purported) advantage of the Cooper analysis: its unified treatment of bound and referential pronouns.

While there are no clear counterexamples to the null hypothesis, I argue (§3.3) that there *are*

clear cases where features do impose restrictions on assignments of values to bound pronouns and thereby (when the pronoun is bound by a quantifier) the domain of values that the quantifier quantifies over. These cases show that the features of bound pronouns contribute to semantic interpretation in a way strictly analogous to the way they contribute to the interpretations of referential pronouns. If bound pronouns are (always or usually) subject to the same feature-induced restrictions on their assignments of value as referential pronouns, then bound pronouns and referential pronouns *cannot* be treated as mere homonyms.

3.1 Extending Cooper’s semantics to bound pronouns

In the previous chapter, we saw how Cooper’s semantics applies to referential pronouns. According to Cooper, pronouns have variable-based logical forms. When a pronoun is referential, like the occurrence of ‘she’ in (4), the variable in its logical form (represented by the numerical index ‘2’) is left free (is not co-indexed with the antecedent QP ‘every girl’), and is assigned a value (e.g. Mary) by an assignment function, g , determined in the utterance context c .

(4) Every girl₁ thinks she₂ will win. $g_c(2) = \text{Mary}$

The *phi-features* of pronouns denote partial identity functions (functions of type $\langle e, e \rangle$) that combine with these contextually-determined variable assignments. The pronoun ‘she’, for example, has the features *feminine* and *singular*.⁴⁹ The value of ‘she₂’ relative to g_c will be identical to $g_c(2)$ (the object g_c assigns to the variable represented by the index ‘2’) only if $g_c(2)$ is *female* and *atomic*. Otherwise, the value of ‘she₂’ will be undefined relative to $g_c(2)$.⁵⁰

$[[\text{she}_n]]^{c;g} = g_c(n)$, if $g_c(n)$ is a female and atomic;
 = # otherwise.

Now, what about the *bound* reading – represented by (5) – where the pronoun is co-indexed with the quantifier phrase ‘every girl’?

⁴⁹ Ordinarily, a referential occurrence of ‘she’ will be taken to refer to an individual distinct from s_c and a_c , the speaker and addressee, respectively, of the utterance context c . In the previous chapter, this requirement was said to be one of a class of *implicated presuppositions* – not a true semantic presupposition.

⁵⁰As before, the hash mark (‘#’) is used to indicate that the semantic value of the pronoun is undefined.

(5) Every girl 1[t₁ thinks sing-fem₁ will win]

The Cooper semantics permits the bound reading of the pronoun to be derived in a strictly analogous way, with the features of the pronoun restricting *bound* variable assignments.

In order to derive this reading in a compositional fashion, we need composition rules and lexical entries that can accommodate the partial interpretations associated with features. Heim supplies the following replacement for the rule of predicate abstraction:

$$[[i \alpha]]^g = \lambda_{x_e}. \alpha \in \text{dom}([[]]^{g^{x/i}}). [[\alpha]]^{g^{x/i}} \quad (\text{Heim 2008, 38}).$$

This rule permits the VP ‘thought she would win’ to inherit the feature-induced presuppositions of ‘she’. The predicate-abstract,

1 [t₁ thought fem-sg₁ would win] ,

... will denote the partial (rather than total) function,

[λx : fem(x) & atom(x). x thought x would win] ,

which is defined only for female and atomic individuals.

Heim also supplies the following entry for ‘every’, which permits it to take partial functions as inputs.

$$[[\text{every}]] = \lambda f_{\langle e, t \rangle}. \lambda g_{\langle e, t \rangle}. \{x: f(x) = 1\} \subseteq \text{dom}(g). \{x: f(x) = 1\} \subseteq \{x: g(x) = 1\}$$

(Heim 2008, 39). The denotation of $[[\text{every}]]$ is defined iff every object that its first (restrictor) argument maps to true (=1) is in the domain of the (possibly partial) function corresponding to its second (nuclear scope) argument. In the case of (5), since the VP ‘thought she would win’ is defined for female and atomic individuals, every element of the restrictor set (every girl) must be female and atomic. As we saw in the previous chapter, this definedness condition, in Cooper’s semantics, corresponds to a *semantic presupposition* of (5).

(5) Every girl 1[t₁ thought sing-fem₁ would win]

Semantic presupposition: Every girl is female and atomic.

Consequently, (5) presupposes *that every girl is female and atomic*, and asserts *that every girl thought she would win*.

While it is formally possible to construct an account of binding and quantification that permits the features of pronouns to project (to contribute semantic presuppositions) the real question is whether the phi-features on bound pronouns are interpreted in the first place – whether bound pronouns are semantic presupposition triggers in the way that referential pronouns are. According to many semanticists, they are not. The visible phi-features of bound pronouns are mere syntactic reflexes that are ‘invisible’ to semantic interpretation.

There are two main accounts of why bound pronouns (purportedly) lack interpreted features. According to the *feature transmission* proposal (Kratzer 1998, 2006, 2008), bound pronouns *originate* as ‘minimal’ pronouns, without any features (with ‘empty feature sets’). Bound pronouns acquire their visible features through a post-semantic process. Features are copied to the pronoun from its binder *after* the process of semantic interpretation is complete. Alternatively, on the *feature deletion* proposal (Heim 2001, 2005a/b, 2008; von Stechow 2002, 2003), bound pronouns originate with semantically interpretable features like any other pronoun. However, any agreeing features on the bound pronoun are deleted in a *pre-semantic* process – a process that terminates *before* semantic interpretation takes place.

What is wrong with the ‘null’ hypothesis that features induce presuppositions on *bound* pronouns such that we need feature deletion and transmission accounts in the first place? According to the proponents of these views, there are certain cases in which bound pronouns range over domains of values unrestrictedly, in ways that would be impossible if their features were interpreted. These cases, it is argued, reveal a more systematic fact about the semantics of bound pronouns: that their features are uninterpreted even in unproblematic cases like (5). Heim argues, for example, that these cases “put us in the uncomfortable situation that a pattern in the data which looks like it ought to fall out from the semantics, and which almost does, nevertheless has a few marginal instances that force us to attribute it to an arbitrary-looking non-semantic mechanism” (such as feature deletion or transmission) (Heim 2008, 54-55). In the following section, I examine each of the four main types of cases that purportedly force us to attribute the features on bound pronouns to extra-semantic

mechanisms. In each case, I argue, there is an alternative, independently motivated way of deriving the relevant interpretation that is compatible with the null hypothesis that features play a semantically significant role.

3.2 Four challenges to the Cooper analysis of bound pronouns

In this section, I examine the case for uninterpreted features on bound pronouns. The discussion is divided into four parts. In each, I review one of the four main (alleged) counterexamples to the null hypothesis, and then show how the problematic reading can be derived in ways compatible with interpreted features.

3.2.1 First challenge: *only-DPs*

The first challenge to the null hypothesis involves quantificational readings of sentences headed by ‘only’-DPs like (6)-(8) below.⁵¹

(6) Only Sue_F did her homework.

(7) Spoken by Sue: Only I_F did my homework.

(8) Only they_F did their homework.⁵²

Each of (6)-(8) has a quantificational reading where the bound pronouns seem to range unrestrictedly over a domain of quantification that includes all the relevant homework-doers – regardless of *gender* in (6), *person* in (6)-(8), and *number* in (6)-(8). For example, (6) is true iff the set of *all* homework-doers is the singleton set containing Sue. If John did his homework in addition to Sue, then (intuitively) (6) is false. The feminine feature on the bound pronoun in (6) thus does not appear to partialize the domain of quantification to *female* students in the way that one might expect if the features on the bound pronoun ‘her’ were interpreted, since the predicate abstract,

⁵¹These cases derive from similar examples in Partee (1989):

(a) It was only me who did my homework.

(b) I’m the only one around here who will admit that I could be wrong.

Partee was the first to propose that bound pronouns do not trigger presuppositions.

⁵² The subscript, uppercase ‘F’ indicates a focused constituent. For example, (6)-(8) should be read with focal stress on ‘Sue’, ‘I’ and ‘they’, respectively. As Sauerland (2002) observes, focus on the bound pronouns is optional. (For a tentative account of this observation, different from Sauerland’s own, see ft. 60.)

2[t₂ did sg-fem₂'s homework] ,

...would then denote the partial function,

[λx: sg-fem(x). x did x's homework] ,

...which applies only to females. (6) would then be true just in case every *female* student did her homework (regardless of whether or not John did his homework), contrary to fact.

Similar remarks apply concerning the *singular number* feature of the pronoun in (6), which does not partialize the domain of quantification to atomic individuals. If some students in Sue's class are assigned homework singly, and others in pairs, and the pair consisting of Elise and Mark did their homework in addition to Sue, (6) is (intuitively speaking) false. However, if 'did her homework' denoted a partial function defined only for atomic individuals, then – the argument goes – (6) would be true just in case every *atomic* individual did his or her homework (regardless of whether the plurality consisting of Elise and Mark did *their* homework).

Example (7) seems to be a particularly stark illustration of the need for uninterpreted features. If the features of the bound occurrence of 'my' project, then,

1[t₁ did 1st-sg₁'s homework],

denotes a partial function with a *singleton domain*, defined only for the speaker:

[λx: 1st-sg(x). x did x's homework].

The same reasoning as applied in the previous case leads us to expect that (7) will be true iff *the speaker* did his or her homework, independently of whether *any other* students did. But this is a rather odd set of truth-conditions to associate with (7). In the usual case, the domain of quantification associated with an utterance of (7) will not be restricted in this way.⁵³

3.2.2 A response to the first challenge

An important clue to how deal with cases like (6)-(8) lies with their focus-markings. A key property of 'only' is that it is a *focus-sensitive operator*, which operates on both the ordinary and focus semantic

⁵³On some semantic theories of 'only', (7) is not just *odd* but a presupposition failure if the domain is restricted in this way, since 'only' is presupposed to quantify over a non-singleton domain.

values of clauses it combines with. Whether (6)-(8) genuinely pose a problem for the null hypothesis depends on the nature of the relation between ordinary and focus semantic values assigned to the VPs, since the latter supply ‘only’ with its domain of quantification, in the form of a set of focus alternatives. As number of authors have pointed out (Jacobson 2008; Spector, as reported in Heim 2005a), these cases can be explained in a way compatible with the view that bound pronouns have interpreted features if we assume that the contributions of phi-features can be ignored in the calculation of focus alternatives. As we will see, there is independent evidence that suggests that this assumption is indeed correct. First, however, we must review some basic features of the focus semantic analysis of ‘only’.

In semantic theories of focus such as Rooth’s (1985) *alternative semantics*, every sentence that contains a focused constituent has two semantic values: an ordinary semantic value and a focus semantic value. Focus semantic values are determined recursively, by rules like the following ones, (a)-(d) (Rooth 1985, 14).⁵⁴

- a. $[[\alpha]]^o = [[\alpha_F]]^o$
- b. $[[\alpha_F]]^f = D_{\text{type}([\alpha]^o)}$
- c. $[[\alpha]]^f = \{[[\alpha]]^o\}$
- d. $[[\alpha \beta]]^f = \{A(B) \mid A \in [[\alpha]]^f, B \in [[\beta]]^f\}$

According to (a), ordinary semantic values are insensitive to focus; thus the ordinary semantic value of a focused element, $[[\alpha_F]]^o$, is simply its regular value, $[[\alpha]]^o$. However, focus semantic values *are* sensitive to focus. According to (b), the focus semantic value, $[[\alpha_F]]^f$, of a focused expression is a set of alternative values of the same semantic type as its ordinary semantic value (including $[[\alpha]]^o$; the alternatives to the ordinary semantic value of an expression α will always include its ordinary semantic value). Meanwhile, *non*-focused expressions do not invoke alternatives; according to (c), the focus semantic value of a simple expression containing no focus-marked material is the singleton set of its ordinary semantic value. Finally, the interpretation of the composition rules must also be

⁵⁴ ‘ $[[\cdot]]^o$ ’ signifies the ordinary semantic value of an expression, while ‘ $[[\cdot]]^f$ ’ signifies its focus value.

formulated at the level of ordinary and focus semantic values. Here we can make do with just one rule: the rule of function application, governing the application of a predicate to its arguments. The alternative to functional application is a set formed by all expressions $A(B)$ (maintaining the same types) that are derived by applying each element A of the first alternative set to an element B of the second alternative set; cf. (d).⁵⁵

By way of illustration, consider (9) below, containing the focused element ‘Bill’:

(9) John introduced Bill_F to Sue.

The focus semantic values of the constituents which are *not* marked for focus (‘John’, ‘Sue’, ‘to’ and ‘introduce’) are singletons containing their ordinary meanings. For example, the focus semantic value of ‘Sue’ is the singleton set containing Sue:

$$[[\text{Sue}]]^f = \{[[\text{Sue}]]^o\} = \{\text{Sue}\}^{56}$$

The focus semantic value of the focused name ‘Bill_F’ is a *set* of alternative values of the same semantic type, the set of objects in the domain of individuals (type e). This is a very large set, however, and focus effects will generally be contextually restricted in one of two ways: to some proper subset of entities of type e or to particular members of that set.⁵⁷ For example, the set of alternatives to Bill might include all and only the other people at John’s party last night: Bill, Sam, Beth, Sue and Ted.

$$[[\text{Bill}_F]]^f = \{\text{John introduced } x \text{ to Sue: } x \in D_e\} = \{\text{Bill, Sam, Beth, Sue, Ted}\}$$

The ordinary semantic value of (9) is obtained in the usual way, by applying the ordinary rule of

⁵⁵ Cf. the ordinary rule of function application: $[[[\alpha \beta]]^o] = [[[\alpha]]^o]([[\beta]]^o)$.

⁵⁶ I assume throughout this chapter that proper names refer to individuals.

⁵⁷To capture this, Rooth proposes that we add a principle governing the interpretation of focus, according to which the focus alternatives to a focused constituent ϕ will consist of (a) some proper subset Γ of the set of entities of the same type as ϕ , or (b) only certain objects matching ϕ in type:

- (a) $\Gamma \subseteq [[\phi]]^f$, where Γ is a variable with the type of a set of objects which match ϕ in type, *or*
 (b) $\gamma \in [[\phi]]^f$, where γ is a variable taking objects matching ϕ in type.

The values of Γ and γ are set by context. In the example above, either: (i) $[[\text{Bill}]]^f \sim \Gamma$, or (ii) $[[\text{Bill}]]^f \sim \gamma$, where ‘ \sim ’ is an operator which introduces the constraint that the focus alternatives to (9) are elements of these sets in the form of a *presupposition*; thus:

- (i) (Set Case) $\phi \sim \Gamma$ presupposes that Γ is a subset of $[[\phi]]^f$, and contains both $[[\phi]]$ and an element distinct from $[[\phi]]$,
 (ii) (Individual Case) $\phi \sim \gamma$ presupposes that γ is an element of $[[\phi]]_F$ distinct from $[[\phi]]$.

Thus focus-sensitive semantic effects will be limited, via semantic presupposition, to either Γ or γ , a subset or member of the set of all entities of the same semantic type as ϕ .

function application (rather than its alternative) to the ordinary semantic values of ‘Bill’, ‘Sue’ and ‘introduced’, yielding the proposition *that John introduced Bill to Sue*.

$$(9') \llbracket \text{John introduced } [\text{Bill}_F] \text{ to Sue} \rrbracket^{\circ} = \{w \in W \mid \text{John introduced Bill to Sue in } w\}$$

The focus semantic value of (9) is obtained by applying the alternative rule of functional application to the focus semantic values of the constituents of (9), yielding a *set* of propositions of the form *John introduced x to Sue*, for each alternative x to John.

$$\begin{aligned} \llbracket \text{John introduced } [\text{Bill}_F] \text{ to Sue} \rrbracket^f &= \{ \{w \in W \mid \text{John introduced } x \text{ to Sue in } w\} \mid x \in D_e \} \\ &= \text{e.g. } \{ \text{John introduced Bill to Sue, John introduced Sue to Sue, John introduced Mary to Sue, ...} \} \end{aligned}$$

Now consider (10), i.e. (9), with the addition of the focus sensitive operator *only*:

$$(10) \text{ John only introduced } \text{Bill}_F \text{ to Sue.}$$

only operates on both the focus and ordinary semantic values of the clause it combines with, taking the proposition p corresponding to the ordinary semantic value of a sentence S , together with the set of alternatives semantic values that give the focus semantic value of S (the alternatives to p), and returning the proposition p' , true iff p is true and no alternative to p besides p itself is true.⁵⁸

$$\llbracket \text{only} \rrbracket = \lambda p [p \ \& \ \forall p' [\llbracket S \rrbracket^f \ \& \ p'] \rightarrow p' = p]$$

(10) will be true if John introduced Bill to Sue and John introduced no one else but Bill to Sue.⁵⁹

$$(10') \llbracket \text{John only introduced } \text{Bill}_F \text{ to Sue} \rrbracket^{\circ} = \text{John introduced Bill to Sue} \ \&$$

$$\forall p [\llbracket p \ \& \ p \in \{ \text{introduced}(\text{john})(x)(\text{sue}) \mid x \in D_e \} \rrbracket \rightarrow p = \text{John introduced Bill to Sue}]$$

(10') states that *John introduced Bill to Sue*, and for all propositions p , if p is true and p is an alternative to the ordinary semantic value of (9), the proposition *that John introduced Bill to Sue*, then $p = \text{John introduced Bill to Sue}$ (i.e. the only alternative to p which is true is p itself).

Let's now apply this analysis to one of the alleged counterexamples to the null hypothesis from above, e.g. (6) (repeated below). The main question to ask about (6) concerns the focus semantic

⁵⁸ The set of alternatives to a focused constituent φ always includes its ordinary semantic value.

⁵⁹ On some views, ‘only’ combines with a clause φ yielding $\llbracket \llbracket \varphi \rrbracket^{\circ} \rrbracket^{\circ}$ as a *presupposition* (rather than an ordinary truth-condition). In other words, the requirement that the ordinary semantic value of the clause be true is taken to be a presupposition rather than an ordinary truth-condition. The full truth-conditions of ‘only φ ’ are: for all p , if $p \in \llbracket \llbracket \varphi \rrbracket^f \rrbracket^f$ and p is true, then $p = \llbracket \llbracket \varphi \rrbracket^{\circ} \rrbracket^{\circ}$.

value of the VP ‘did her homework’.

(6) Only Sue_F did her homework.

Assuming that the pronoun ‘her’ is bound and that its phi-features are interpreted, the ordinary semantic value of the VP will be the restricted function: $[\lambda x: 3^{\text{rd}}\text{-sg-fem}(x). x \text{ did } x\text{'s homework}]$. This combines with the ordinary semantic value of the proper name ‘Sue’, yielding the proposition *that Sue is a self’s homework-doer* as its non-presuppositional content, along with a presupposition *that Sue is female*.

- a. $[[\text{Sue}_F]]^o = \text{Sue}$
- b. $[[\text{did her homework}]]^o = [\lambda x: 3^{\text{rd}}\text{-sg-fem}(x). x \text{ did } x\text{'s homework}]$
- c. $[[\text{Sue}_F \text{ did her homework}]]^o = \text{Sue is a self’s homework-doer.}$

If we assume that the focus semantic value of the VP is the singleton containing the restricted function in (b), then we get the problematic consequence the focus semantic value of $[[\text{SUE did her homework}]]$ is a set of propositions concerning all and only the other girls in Sue’s class. The proposition *John is a self’s homework doer* will not be in this set.

- d. $[[\text{did her homework}]]^f = \{[\lambda x: 3^{\text{rd}}\text{-sg-fem}(x). x \text{ did } x\text{'s homework}]\}$
- e. $[[\text{Sue}_F \text{ did her homework}]]^f = \{\text{Sue is a self’s homework-doer, Mary is a self’s homework-doer, Jane is a self’s homework-doer, ...}\}$

The operator *only* will then take the proposition $p = \text{Sue is a self’s homework-doer}$, together with the set of alternatives to p in (e), and return the proposition p' which is true iff p is true and no other alternative in the set (e) is true:

- (6') $[[\text{only Sue}_F \text{ did her homework}]]^o = \text{Sue is a self’s homework-doer} \ \&$
 $\forall p [[p \ \& \ p \in \{x \text{ did } x\text{'s homework} \mid x \in D_e\}] \rightarrow p = \text{Sue is a self’s homework-doer.}$

As a consequence, we incorrectly predict that (6) can be true if both Sue *and* John did their homework, since the proposition that *John is a self’s homework doer* is not in the alternative set, (f).⁶⁰

⁶⁰ Since the quantificational effects in (6) are not tied to the binding of the pronoun and are instead the result of the quantifier quantifying over the alternative propositions in the focus semantic value of (6), we could also in principle treat the pronoun ‘her’ as a referential pronoun – though there is no reason to think that we must do

Jacobson (2008; see also Heim 2005a, citing Spector) suggests that the problem lies with the assumption that the focus semantic value of the VP is the singleton set consisting of both the presuppositional and non-presuppositional semantic values of the VP.⁶¹ Suppose we suspend this assumption, permitting the phi-features of the pronoun in (6) to be interpreted and impose definedness conditions at the level of ordinary semantic values, but not at the level of focus semantic values. As Jacobson points out, we can then capture the fact that (6) denies that anyone besides Sue did that person’s homework regardless of the person’s gender, while maintaining that the pronoun’s features are semantically interpreted. The regular semantic value of the VP ‘did her homework’ will

so. Indeed, there is some evidence that the pronouns in examples like (6)-(8) can both be taken to be free or bound. As Sauerland (2002, 2008b) observes, there are two different ways to pronounce examples like (6)-(8), one with focus on the pronoun in the subordinate clause and one without. This is somewhat anomalous, since focus is not usually *optional* (cf. Rooth’s 1995 argument for the principle *avoid-F*; for further discussion of issues around optional pronoun focusing see Jacobson 2000 and Sauerland 2008b). Sauerland’s explanation is that focus is optional when pronouns are bound, but it is obligatory when they are free. Focusing is *required* when ‘her’ in (6) has referential occurrence since the focus semantic value of the pronoun would otherwise consist of the singleton set containing its referent, Sue (where ‘s’ is a constant referring to Sue). Consequently, $[[\text{Sue}_F \text{ did her homework}]]^f$ would be the set $\{\text{Sue did Sue’s homework, Ted did Sue’s homework, Mary did Sue’s homework, ...}\}$. Focusing the embedded pronoun permits its focus semantic value to be a non-singleton set of individuals.

- (a) $[[\text{her}_F]]^o = s$
- (b) $[[\text{her}_F]]^f = \{\text{Sue, Bill, Mary, Ted, ...}\}$

Applying the rule of functional application for alternatives yields a set of propositions of the form $x \text{ did } x\text{'s homework}$, where x is an alternative to Sue in the set (b) above.

$$[[[\text{Sue}_F] \text{ did } [\text{her}_F] \text{ homework}]]^f = \{\{w \in W \mid x \text{ did } x\text{'s homework in } w\} \mid x \in D_e\}$$

=e.g. $\{\text{Sue did Sue’s homework, Bill did Bill’s homework, Mary did Mary’s homework, ...}\}$ ⁶⁰

Adding in *only*:

$$(6'') \quad [[[\text{only } [\text{Sue}_F] \text{ did } [\text{her}_F] \text{ homework}]]^o = \text{Sue did Sue’s homework} \ \& \ \forall p \ [[p \ \& \ p \in \{x \text{ did } x\text{'s homework} \mid x \in D_e\}] \rightarrow p = \text{Sue did her homework}.$$

(6'') states that *Sue did her homework*, and for all propositions p , if p is true and p is an alternative to the ordinary semantic value of (6), then $p = \text{Sue did Sue’s homework}$. This is the desired reading. The important observation is that this reading will be derived on the bound variable interpretation of the pronoun *without* the need for focus, so long as feature-based restriction are not incorporated into the focus semantic value of the VP. If the focus semantic value of the predicate abstract,

$$1 \ [t_1 \text{ did her}_1 \text{ homework}] ,$$

.... is the singleton containing its regular semantic value minus the contribution of the pronoun’s feature (a total function), then – as argued above – the set of alternatives to *Sue is a self’s-homework doer* will be a non-singleton set of propositions obtained by applying the unrestricted function denoted by the VP to the focus value of ‘Sue_F’ (a non-singleton set of alternatives to $[[\text{Sue}_F]]^o$). Thus Jacobson’s proposal might also go some way towards explaining the optional nature of focus in examples like (6’).

⁶¹ Jacobson defends a variable-free theory of pronouns, according to which pronouns denote identity functions that are partial if the pronoun is associated with interpreted features. For example, $[[\text{her}]]$ denotes a domain restricted identity function, $\lambda x: x \in 3^{\text{rd}}\text{-sg-fem.}[x]$. Since all semantic interpretation proceeds in a strictly local fashion on the variable-free approach, Jacobson argues, pronouns “do not know whether they will be free or bound” and must start out with the same semantics (2012, 14). Consequently, $[[\text{her}]]$ must denote the same restricted function whether it is bound or free. On Jacobson’s version of the above proposal, while the ordinary semantic value of a pronoun a restricted function, the focus semantic value is an *unrestricted* identity function $[[\text{her}]]^f = \lambda x[x]$.

be a partial function from individuals to truth-values,

$$a. [[\text{did her homework}]]^o = [\lambda x: 3^{\text{rd}}\text{-sg-fem}(x). x \text{ did } x\text{'s homework}]$$

However, the corresponding *focus* semantic value of the VP will be the singleton set containing the corresponding total function.

$$b. [[\text{did her homework}]]^f = [\lambda x. x \text{ did } x\text{'s homework}]$$

The ordinary and focus semantic values of ‘Sue_F’ are combined by regular and alternative functional application with the ordinary and focus semantic values of [[did her homework]]. The ordinary semantic value of [[Sue_F did her homework]] will be the proposition *that Sue is a self’s homework-doer*, while applying the focus semantic value of the VP, in the form of the unrestricted function, to all of the members of the focus value of [[Sue_F]], will yield a set of propositions of the form *x is a self’s homework-doer* (unrestricted by gender, number or person).

$$[[\text{Sue}_F \text{ did her homework}]]^o = \textit{that Sue is a self's homework doer}$$

Presupposition: *Sue is female and atomic.*

$$[[\text{Sue}_F \text{ did her homework}]]^f = \{\textit{that Sue is a self's homework-doer, that Bill is a self's homework-doer, that Ted is a self's homework-doer, ...}\}$$

As before, the operator *only* will take the proposition $p = \textit{Sue is a self's homework-doer}$, together with the set of – feature unrestricted – alternatives to p , and return the proposition p' true iff p is true and no other alternative to p is true.

$$(6') [[\text{only Sue}_F \text{ did her homework}]]^o = \textit{Sue is a self's homework-doer, if Sue is female and atomic,}$$

= # (is undefined) otherwise, and

$$\forall p [[p \ \& \ p \in \{x \text{ did } x\text{'s homework} \mid x \in D_e\}] \rightarrow p = \textit{Sue is a self's homework-doer}.$$

According to (6'), (6) presupposes *that Sue is female and atomic* and asserts that *Sue is a self’s homework-doer*, and for all propositions p , if p is true and p is an alternative to the proposition that *Sue is a self’s homework-doer* (any alternative proposition of the form $x \text{ did } x\text{'s homework}$, where $x \in D_e$), then $p = \textit{Sue is a self's homework-doer}$.

On this proposal, ‘only’ does not ‘see’ the features of the pronoun in (6) because they do not

contribute to the computation of the focus alternatives ‘only’ quantifies over. Assuming that focus semantic values are determined without taking into account the contribution of features, Jacobson’s proposal accounts for the observation that (6) quantifies unrestrictedly over a set of alternative propositions *x is a self’s-homework doer* in a way that is compatible with the null hypothesis.

But what evidence there is for Jacobson’s conjecture that presuppositional aspects of the ordinary semantic values of pronouns are ignored in the computation of focus alternatives in examples like (6)-(8)? Jacobson does not say (apart from the fact that it gets us the right results in these cases). Nevertheless, there *is* independent evidence for this view. In a range of cases, the focus values assigned to other (*non-pronominal*) presupposition triggers do not incorporate presuppositional aspects of their ordinary semantic values.

Beaver and Clark (2008) observe that since definite descriptions trigger definiteness presuppositions, it is natural to assume that the alternative set invoked by the focus marking of a definite descriptions like the one in (11) will be a set of partial functions mapping worlds to individuals (e.g. *the secretary of state, the secretary of the treasury, the vice president, ...*)

- (11) a. $[[\text{the president}_F]]^O = \iota x [\text{president}(x)]$
 b. $[[\text{the president}_F]]^f = \{X(Y) \mid X \in \{t\}, Y \in [[\text{president}_F]]^f\}$
 $= \{d \mid d = \iota x [R_x] \text{ for some } R \in [[\text{president}_F]]^f\} = \{\iota x [\text{secretary of state}(x)], \iota x [\text{vice-president}(x)], \iota x [\text{secretary of the treasury}(x)], \dots\}$

However, as a variety of authors have observed (see von Heusinger 1998, 1999, 2007; see also Kamp and Riester 2010), this view cannot – or cannot always – be right. Presuppositions of definiteness are *not* always preserved in the construction of the alternative sets of focused definite descriptions.

Suppose that (12a) is uttered at a faculty party where there is more than one professor representing each country, but only one professor representing the Netherlands (i.e. several French professors, and several Italian professors, ... but only one Dutch professor):

- (12a) John only talked to [the Dutch_F professor].

As von Heusinger (2007) observes, applying Beaver and Clark’s strategy for constructing alternative

sets in (11) to (12a), generates a set of alternatives like (12b) for [[the Dutch_F professor]]:

(12b) {[[the Dutch professor]], [[the French professor]], [[the Italian professor]], . . . }

However, since there is more than one professor representing each country except the Netherlands, the values of all the individual concepts in this set – with the exception of the exception of [[the Dutch professor]] – are undefined at the context of report. For example, the values of the individuals concepts [[the French professor]], [[the Italian professor]], [[the Armenian professor]], . . . will all be undefined, since there is no unique French, Italian or Armenian professor. The set of (defined) alternatives to [[the Dutch_F professor]] will thus be the singleton set containing its ordinary semantic value.

c. [[the Dutch_F professor]]^o = λx [Dutch(x) & professor(x)]

d. [[the Dutch_F professor]]^f = { λx [Dutch(x) & professor(x)]}

Since the proposition $p = \textit{that John talked to the Dutch professor}$ is the unique true proposition in the set of alternatives to p , (12a) is predicted – incorrectly – to be true if John talked to both the Dutch professor and one of the (two or more) French professors. What we want instead to predict is that (12a) is true iff John talked to the Dutch professor and no other professor at the party – regardless of nationality. For example, if the professors at the party are a , b , c and d , and a is the Dutch professor, then (12a) will be true if John talked to a , and John did not talk to b , c or d . In order to capture this, von Heusinger observes, the set of alternatives to [[the Dutch_F professor]] must be taken to consist of a set of *individuals* – the set $\{a, b, c, d\}$ – rather than a set of individual concepts.

Example (13a) illustrates the same phenomenon. Kamp and Riester (2010) argue that the alternative set in (13b) is not appropriate for the definite description in (13a), since (13a) will end up with the wrong truth-conditions if the definiteness presuppositions associated with any of the individual concepts in the set in (13b) fails. For example, given the set of alternatives in (13b), (13a) is predicted to be true, contrary to fact, if John caught the monkey who threw a tomato at Lisa and one of a pair of cucumber-throwing monkeys.

(13) a. John only caught [the monkey which threw a tomato_F at Lisa].

- b. {[[the monkey which threw a tomato at Lisa]], [[the monkey which threw a cucumber at Lisa]], [[the monkey which threw a carrot at Lisa]], ... }

What we want is for (13a) to be true just in case John caught m_1 , the monkey who threw a tomato at Lisa, but none of the other vegetable-throwing monkeys m_2, \dots, m_n , whether or not some of m_2, \dots, m_n threw vegetables of the same kind as one another. This requires that the alternative to the semantic value of ‘the monkey which threw a tomato_F at Lisa’ be the set $\{m_1, m_2, \dots, m_n\}$. The alternative set must be constructed on the basis of the propositional content of the description – without taking account of the associated definiteness presupposition.⁶²

Similar examples arise with other types of presupposition-triggering expressions. The focused presupposition trigger in (14) is the factive verb ‘know’, defined only for true propositions. In (15), it is the aspectual verb ‘stop’, which triggers a presupposition that the action or event characterized in the complement clause has been initiated or begun.

- (14) a. John knows_F that the boogeyman exists.
 b. {[[John knows that the boogeyman exists]], [[John believes that the boogeyman exists]], [[John hopes that the boogeyman exists]], ... }
- (15) a. John stopped_F calling Sue.
 b. {[[John stopped calling Sue]], [[John started calling Sue]], [[John is calling Sue]], ... }

The focus semantic value of ‘John knows_F that the boogeyman exists’ is not required to be a set of propositions like: $\{John\ knows\ that\ the\ boogeyman\ exists, John\ sees\ that\ the\ boogeyman\ exists, John\ realizes\ that\ the\ boogeyman\ exists\}$, which preserve the presupposition *that the boogeyman exists*, but is more naturally taken to be a set like: $\{John\ believes\ that\ the\ boogeyman\ exists, John\ fears\ that\ the\ boogeyman\ exists, John\ suspects$

⁶² von Heusinger and Beaver and Kamp assume that definite descriptions are not *expressive* presupposition triggers of the kind considered in §2.3.5: that they denote individual-concepts rather than individuals and that their presuppositions must be satisfied at the circumstance rather than the context. Of course, one explanation of the alternative sets in (12) and (13) is that definite descriptions *are* individual-denoting expressive presupposition triggers. However, if definite descriptions are in fact expressive presupposition triggers, and this fact is sufficient to explain the non-presuppositional character of these alternative sets, then a similar explanation might be offered of cases like (6)-(8), since pronominal phi-features are also (perhaps better) candidates for expressive presupposition triggers.

However, one difficulty with this account of (12) and (13) (apart from the fact that it rests on a controversial view of the semantics of definite descriptions) is that examples like (14) and (15) seem to show that *non*-expressive presuppositions can *also* be ignored in the calculation of focus alternatives.

that the boogeyman exists}. Similarly, the focus semantic value of ‘John stopped_F calling Sue’ can include propositions like *John started calling Sue*, *John hasn’t called Sue*, etc. The presuppositions triggered by factive and aspectual verbs are *not* preserved across the range of focus alternatives.

The observation that the presuppositional aspect of the regular semantic values of the triggers in (12)-(15) do not enter into the calculation of their focus semantic values lends credence to Jacobson’s account of cases like (6)-(8).

(6) Only Sue_F did her homework.

(7) Only I_F did my homework.

(8) Only they_F did their homework.

On Jacobson’s account, the quantificational effects in (6)-(8) are not generated by the pronoun in the embedded clause ranging over different values as part of its regular meaning. Instead, binding occurs separately in the regular and in the focus values. On this view, the fact that the domain of quantification is not partialized (e.g. to female individuals or to the speaker) indicates that features do not contribute to the set of alternative propositions that supply ‘only’ with its quantificational domain. The further conclusion that features do not contribute to the *ordinary* semantic values of the bound pronouns is unwarranted. In particular, this further conclusion follows only if presuppositional dimensions of meaning are regularly preserved in the computation of their focus semantic values. As we have seen, however, there is independent evidence that presuppositional dimensions of meaning are *not* preserved in the computation of focus semantics values. Consequently, the simplest and most conservative explanation of the unrestricted quantificational readings of (6)-(8) is that feature contributions are preserved at the level of ordinary meanings, but are ignored in the computation of focus alternatives.⁶³ Assuming that there is no *independent* reason to

⁶³ These observations raise a variety of questions about how focus alternatives are generated and what kinds of semantic objects the arguments to focus operators are (see von Stechow 1999, Ch. 5 for discussion; also Kamp and Riester 2010 and Mayr 2011). Fortunately, we can set these questions aside; a full account of how and why focus semantic values are sometimes blind to the presuppositional dimension of the ordinary semantic value of a focused expression goes the beyond the scope of what we can (and need to) achieve here; the purely descriptive observation that focus semantic values *are* sometimes blind to the presuppositional dimension of the ordinary semantic value of a focused expression is enough to lend plausibility to Jacobson’s strategy.

hold that bound pronouns lack interpreted features, we should no more conclude that bound pronouns are not presupposition triggers on the basis of examples like (6)-(8) alone, than we should conclude, on the basis of examples like (12)-(13), that definite descriptions do not trigger definiteness presuppositions.⁶⁴

3.2.3 Second challenge: sloppy VP-ellipsis cases

Our second challenge to the null hypothesis again raises questions about the construction of focus semantic values. This challenge involves examples like (16)-(18) below where an elided verb phrase (e.g. “did her homework”) contains a pronoun:

(16) Sarah_F did her homework. John_F didn't. (=John didn't do *his* homework.)

(17) Every girl_F did her homework. Every boy_F did, too. (=Every boy did *his* homework.)

(18) They_F did their homework. Sue_F did, too. (=Sue did *her* homework.)

⁶⁴ One potential disanalogy between examples like (12)-(13) and (6)-(8) is that the definite descriptions in (12)-(13) are *focused*, whereas focus on the bound pronouns in (6)-(8) is *optional*. Thus it might be objected that even if it is possible to ignore presuppositional dimensions of the meanings of a focused expression, we have not seen that it is possible to disregard the presuppositional dimensions of the meanings of unfocused or optionally focused expressions, like the bound pronouns in (6)-(8). The key point to note in response, however, is that since the value of e.g. the pronoun ‘her’ in (6) is bound to the values of the antecedent, focused proper name, we cannot have a situation in which focus semantic value of the proper name is a set of individuals like {Sue, Bill, Ted, John, Mary}, where only some elements of the set are admissible values for the pronoun ‘her’. Consider the following case from Büring (2007):

(a) Claudia knows her password.

Büring asks whether there is any way to determine, on the basis of truth-conditions, whether the relation between the proper name ‘Claudia’ and the pronoun ‘her’ is binding, as in (i), or mere coreference, as in (ii).

i. Claudia λ_2 [knows her₂ password]

ii. Claudia knows her₂ password (g(2) = Claudia)

In fact, (i) and (ii) deliver the same truth conditions for (a). Consequently, it might appear that it does not matter, truth-conditionally speaking, whether pronouns in sentences like (a) are interpreted as anaphoric or referential. As Büring argues, however, this will not always be the case. In particular, bound and referential interpretations can be distinguished on the basis of truth-conditions if the antecedent is associated with focus as in (b):

(b) I only want CLAUdia_F to know her password.

i. I only want Claudia_F λ_2 [to know her₂ password]

Claudia should know her own password, no one else should know their own password.

ii. I only want Claudia_F to know her₂ password (g(2) = Claudia)

Claudia should know her password and no one else should know Claudia's password.

Notice that Büring assumes that if the pronoun ‘her’ is bound to Claudia, as in (b-i), it will covary with the focus alternatives to Claudia (whereas if the pronoun and name merely corefer, the pronoun's referent remains constant for all focus alternatives). The reason why this must be the case is that ‘her’ can only be bound to ‘Claudia’, so that the values of the pronoun depend on the alternate values of the proper name, if, whenever ‘Claudia’ bears focus, so that the focus semantic value of ‘Claudia’ is a set like {Bill, Ted, Sue, Mary, ...}, the bound pronoun is capable of ranging over the elements of the same set. The thought, then, is that by focusing the antecedent proper name, one thereby achieves the effect of focusing the pronoun it is co-indexed with.

It will be helpful to begin by considering a straightforward case of VP ellipsis like (20):

(20) Sarah_F did her homework. Sue_F didn't. (=Sue didn't do her homework.)

Ross (1967) observes that sentences containing pronouns in elided VPs are ambiguous between *strict* and *sloppy* readings. On the *strict* reading, (19) is true if Sue didn't do *Sarah's* homework. On the *sloppy* reading, it is true if Sue didn't *her own* (Sue's) homework.

(19) Sarah_F did her homework. Sue_F didn't.

Strict: Sarah did her own (Sarah's) homework. Sue didn't do Sarah's homework.

Sloppy: Sarah did her own (Sarah's) homework. Sue didn't do her own (Sue's) homework.

On the classical theory of VP ellipsis of Sag (1976) and Williams (1977), the elided sentence in (19) is interpreted by reconstructing the antecedent VP into the ellipsis site. The sloppy reading is obtained when the pronoun is bound by the λ -operator inserted below the c-commanding subject (*cf.* (19)).

(19) Sue [λx_1 . did her₁ homework] (sloppy)

On this view, VP ellipsis is licensed only if the deleted VP and its antecedent have logically equivalent LF representations, where two expression *a* and *b* are logically equivalent iff they have the same semantic value under every assignment: iff, under every assignment *g*, $[[a]]^g = [[b]]^g$. This criterion for VP ellipsis, together with the observation that the ellipsis-containing sentences in (16)-(18) have sloppy readings, raises a challenge for the null hypothesis. Consider (17):

(17) Every girl_F did her homework. Every boy_F didn't. (= Every boy didn't do his homework.)

On the sloppy interpretation, the elided pronoun is bound, ranging over a set of boys, and the sentence is true just in case either some boy did not do his homework (wide scope negation) or no boy did his homework (narrow scope negation). The question is how this can be so, if the elided and antecedent VPs are logically equivalent *and* the features on the bound pronoun in the antecedent VP are interpreted. If the features of the bound pronoun are interpreted, the antecedent VP denotes the restricted function,

$[[\text{did her homework}]] = [\lambda x: 3^{\text{rd}}\text{-sg-fem}(x). x \text{ did } x\text{'s homework}]$

... which is undefined for the values the quantifier ‘every boy’ ranges over. The sloppy reading of (17) ought to be unavailable – contrary to fact – since the elided sentence falsely presupposes that *every boy is female*.

According to a variety of authors (Keenan 1971; Partee 1989; Kratzer 1998, 2006, 2008; Chung 2000; von Stechow 2003; Heim 2008, *inter alia*), the sloppy readings of sentences like (16)-(18) are available because the bound pronouns in the antecedent VPs lack semantically interpreted features, so that e.g. the antecedent VP in (17) denotes the total function:

$$[[\text{did her homework}]] = [\lambda x: x \text{ did } x\text{'s homework}]$$

This representation can be straightforwardly copied into the ellipsis site *without* violating the requirement that the deleted VP and its antecedent have logically equivalent LF representations.

3.2.4 A response to the second challenge

One difficulty with taking VP ellipsis cases like those in (16)-(19) to show that the null hypothesis is false is that there is independent evidence against the main assumption that generates our puzzle: that elided VPs cannot differ in interpretation from their antecedents. An example of this is so-called ‘vehicle change’. According to Fiengo and May (1994), a proper name in an antecedent VP can be replaced with a bound pronoun in an elided VP in order to avoid a Condition C violation. For example, in (20), the proper name ‘John’ is replaced by the pronoun ‘him’.⁶⁵

(20) I_F voted against John₁, but he₁ thinks that Mary_F did. (= he₁ thinks that Mary_F voted against him₁.)

According to Schlenker (2003a) and Safir (2005) (see also Heim 2005a), this kind of alternation between forms is not always forced by a Condition C violation. In (21), for example, the trace left by the movement of ‘some rumors’ is replaced by the pronoun ‘them’.

(21) I_F hear some rumors₁ before you_F t₁ do. (=I hear some rumors₁ before you hear them₁.)

As Heim (2005a) observes, the truth-conditions for (21) require that some particular rumor *r* or other

⁶⁵ Chomsky’s Condition C specifies that a proper name or definite description cannot be c-commanded by a co-referring expression.

be such that the speaker hears *r* before the addressee hears *r*. If the elided VP were reconstructed as ‘hear some rumors’, (21) would be true just in case the speaker hears some rumor *r* before the addressee hears some rumor *r*’, where *r* and *r*’ are possibly distinct.

Here it is natural to ask whether examples like (16)-(18) *also* involve vehicle change. According to Heim, cases like (16)-(18) *cannot* involve vehicle change, since:

[T]he other attested cases of ‘vehicle change’ all involve differences between semantically equivalent forms. [Cases like (19)] fit in with them only if the person-features are not interpreted. So vehicle change is not an alternative to feature deletion, but rather relies on it. (Heim 2005a, 6)

In a case like (20), for example, the proper name and the bound pronoun ‘his’ (relative to an assignment) have identical interpretations (assuming, in a partly question-begging fashion, that the phi-features of the pronoun are uninterpreted).

One difficulty with Heim’s response is that it is easy to find examples where an antecedent and elided VP alternate between non-equivalent forms – particularly, between *presuppositionally* non-equivalent forms. For example, (22)-(24) all have sloppy readings:

(22) John said he spoke to the president. But the president said he/John didn’t.

(=the president said he/John didn’t speak to *him*)

(23) *John to Sue*: I think that Fred voted against his sister.

Fred’s sister: I think that Tom did. (=I think that Tom voted against *me*)

(24) The farmer who owns a horse feeds the horse. The farmer who owns a donkey does too.

(=The farmer who owns a donkey feeds *the donkey/it* too.)

In (22), the antecedent definite description, ‘the president’, which triggers the presupposition *that there exists a unique president*, is replaced by the pronoun, ‘him’ (again: to avoid Condition C violation), which is either associated with *different* presuppositions – if the features of ‘him’ are interpreted (gender and number presuppositions) – or no presupposition (if the features of ‘him’ are uninterpreted). Here, in contrast with cases like (16)-(18), we cannot explain the alternation between forms by assuming that features are deleted under binding, since it is the definiteness presupposition of ‘the president’ that the elided pronoun lacks. The two forms will be semantically non-equivalent

whether the features of the elided pronoun are interpreted or not.

Another reason to think the alternation between forms in cases like (16)-(19) is not a consequence of the fact that bound pronouns lack interpreted features is that whatever explains the fact that VP ellipsis can ignore the contributions of the features on *bound* pronouns presumably *also* explains why VP ellipsis can ignore the contributions of the features on *referential* pronouns in cases like (25) and (26). (These examples are similar to ones found in Sag and Hankamer (1984), Kitigawa (1991), Fiengo and May (1994) and Kempson et al (1999).)

(25) Have you seen my keys?

No, I haven't. (=I haven't seen your keys)

(26) I thought you would win.

You did? (= You thought I would win?)

In examples like (25) and (26), the VP ellipsis only allows a strict reading: the pronouns in the elided VPs and the corresponding pronouns in the antecedent VPs co-refer (e.g. the referent of the overt pronoun 'my' and the elided pronoun 'your' in (25) are identical.) One conclusion that many authors have drawn from such cases is that whatever process is responsible for VP ellipsis is indifferent to the person, number and gender features of pronouns. However, if the ellipsis process is *generally* blind to the contributions of features – even when those features *must* be interpreted (because the pronoun is referential), then it seems misguided to attribute the sloppy readings of examples like (16)-(18) to a special property of bound pronouns – in particular, to a lack of interpreted phi-features. What is needed instead is a general theory of ellipsis licensing that accommodates the fact that phi-feature identity is not necessary for VP ellipsis.

If our earlier observations concerning focus semantic values are on the right track, then one theory of ellipsis that accommodates the observation that an elided VP and its antecedent can have different presuppositional semantic values is Rooth's (1992, 1995) *focus theory* of ellipsis. According to Rooth, VP ellipsis is licensed when the elided VP is contained in a phrase that *contrasts appropriately* with some phrase that contains its antecedent:

Licensed VP-Deletion: a VP can be deleted if it is contained in a phrase that contrasts appropriately with some phrase that contains an antecedent VP.

The notion of an appropriate contrast is based on the notion of a focus semantic value. Following Heim (1997), a constituent ψ is said to contrast appropriately with a constituent ϕ iff:

- (i) $[[\phi]]$ is distinct from $[[\psi]]$,
- (ii) $[[\phi]] \in [[\psi]]^f$, i.e. $[[\phi]]$ is an element of the focus value of $[[\psi]]$.

In other words, the interpretation of ϕ must be an element of focus semantic value of ψ , but distinct from ψ 's regular semantic value.

The crucial question is what the focus semantic values of the phrases containing the elided VPs in examples like (16)-(18) are. Consider (16):

(16) Sarah_F did her homework. John_F didn't. (=John didn't do *his* homework.)

If we assume that *presuppositions do not (or do not always) enter into the computation of focus semantic values* – in the way suggested in §3.1.1 – then the focus semantic value of the elided sentence is a set of propositions obtained by applying the focus value of the VP to each of the alternatives corresponding to the focus value of the proper name 'John'.

$[[\text{did his homework}]]^f = \{\lambda x[x \text{ did } x\text{'s homework}]\}$

$[[\text{JOHN}_F]]^f = \{\text{John, Sarah, Bill, Mary, ...}\}$

$[[\text{JOHN}_F \text{ did his homework}]]^f = \{\text{John is a self's-homework-doer, Sarah is a self's-homework-doer, Bill is a self's-homework-doer, ...}\}$

Since the proposition *that Sarah is a self's homework doer* is an element of this set and distinct from the proposition *that John is a self's-homework doer*, the elided VP is contained in a phrase that is interpretatively distinct from and an appropriate contrast to the antecedent VP. Consequently, VP ellipsis is licensed – despite the presence of interpreted features on the bound pronoun.

In summary, we have seen that there are several distinct problems with the claim that sloppy VP ellipsis cases like (16)-(18) witness the phenomenon of bound pronouns with uninterpreted features. The first of these is that the argument rests on strong and controversial assumptions about

the licensing conditions for VP ellipsis – in particular, the view that an elided an antecedent VP must be semantically equivalent, and, moreover, equivalent up to and including presuppositional aspects of meaning. This view appears to be contradicted by cases of vehicle change and – more to the present point – by cases like (22)-(26), where a presupposition-trigger in the antecedent clause (e.g. a definite description) is replaced in the elided clause by a pronoun or other expression without an equivalent presupposition, as in (22) (repeated).

(22) John_F said that he met the president, but the president_F said that John didn't. (= The president said that John didn't meet him.)

If it is inappropriate to conclude from the availability of a sloppy VP ellipsis reading of (22) that the antecedent definite descriptions does not trigger a semantic presupposition, then by parity of reasoning it seems inappropriate to conclude from the availability of a sloppy VP ellipsis reading of an example like (17) (repeated below) that the features of the bound pronoun in the antecedent VP do not trigger presuppositions.

(17) Every girl did her homework. Every boy did too. (=Every boy did his homework.)

Instead, it seems more appropriate to conclude that sloppy VP ellipsis does not require that an antecedent and elided clause be associated with identical semantic presuppositions.

This conclusion is reinforced by examples like (25) (repeated below), where VP ellipsis can ignore the contributions of the features on a *referential* pronoun.

(25) Have you seen my keys?

No, I haven't. (=I haven't seen your keys)

If the ellipsis process in (25) does not 'see' the contributions of features even when those features *must* be interpreted because the pronoun is referential, then a general theory of VP ellipsis (like Rooth's focus theory) that is blind to differences arising at the level of presupposition (in something like the way that the focus semantic values are blind to presuppositional dimensions of meaning) will anyway be required. In that case, it seems inappropriate and unnecessary to explain the availability of sloppy readings by appealing to uninterpreted phi-features on bound pronouns.

3.2.5 Third challenge: dependent readings

The third challenge to the null hypothesis takes us outside the realm of focus-sensitive constructions. These cases involve plural pronouns occurring in conjunction with plural and floated quantifiers like ‘all’, ‘few’, and ‘each’.

(27) All candidates think they will win.

(28) Few men brought their children.

(29) Each of them thought they would win.

In each of (27)-(29), the quantifier seems to range over a set of atoms in spite of the plural feature on the bound pronouns. On the natural reading of (27), for example, the sentence is true just in case all individuals in the set $\{x: x \text{ is a candidate}\}$ are in the set $\{x: x \text{ thinks } x \text{ will win}\}$. If the latter set is restricted to pluralities, however, then (27) will presuppose that every candidate is a plurality. But (27) is perfectly acceptable (is not a presupposition failure) if each candidate is (as it is natural to assume) a single (i.e. atomic) individual

As Heim observes, it is tempting to attribute the quantificational readings of (27)-(29) to the weak semantics of the plural feature. In Chapter 2, we saw that some authors (Sauerland 2003, 2008a, building on Heim 1991; Sauerland et al, 2005; Schlenker 2003a, 2012) deny that the feature *3rd person* is associated with a genuine semantic presupposition. The 3rd person feature is instead said to generate a weak ‘implicated presupposition’ that the pronoun does not refer to either the speaker or addressee. For analogous reasons, the *plural* number feature is also said to trigger an implicated presupposition. Compare (30a) and (30b):

Context: The speaker does not know whether one person or several people were over at John’s last night:

(30) John had a party last night. I’m not sure if more than one person went over...

a. ...but whoever they were, *they* left a mess.

b. ? ...but whoever he was, *he* left a mess.

The plural pronoun ‘they’ in (30a) can – while the singular pronoun ‘he’ in (29b) cannot – refer to or range over a set of values that may or may not include non-atoms. The view that the plural feature does not semantically encode the information that the referent of the pronoun is a plurality is said to account for this fact.

If plural number features generate implicated presuppositions, it might be thought that (27)-(29) do not raise any serious problems for the null hypothesis, since the bound pronouns will not generate semantic presuppositions at odds with the atomicity of the elements in the quantifiers’ domains.

However, as Heim observes (citing Rullmann 2004), strictly analogous cases like (31)-(33) cannot be accounted for by appealing to implicated presuppositions:

(31) Each of us thought we would win.

(32) You both were sure you would get the job.

(33) We each/all/both thought we would win.

On the one hand, if any features contribute true semantic presupposition triggers, it seems that 1st person features are. On the other, in these cases, like those in (27)-(29), the pronouns range over elements at odds with the 1st person feature-imposed requirement that the values of the pronouns include the speaker, *s_c*. For example, on the relevant reading of (31), the sentence is true if every atomic element in the set (or plural sum) denoted by the matrix subject ‘we’ is in the set {*x*: *x* thinks *x* will win} – where the latter set is not restricted to pluralities including *s_c*. Consequently, (31) cannot have an LF like (31’):

(31’) 1st-pl₂ each 4[t₄ think 1st-pl₄ will win] (Heim 2008, 47)

Instead, as a variety of authors have argued (see von Stechow 2002, Rullmann 2003, Sauerland 2003, and Heim 2008), it seems that the features on the (apparently) bound plural pronoun must be uninterpreted, permitting the pronoun to range over the atomic parts of each plurality.

3.2.6 A response to the third challenge

A key assumption behind the claim that (27)-(33) witness bound pronouns with uninterpreted features is that the plural pronouns are true bound pronouns. In Heim (2008, 46) and Heim, Lasnik and May (1991) (see also Dimitriadis 2000), the relevant readings of (27)-(33) are said to be distributive readings, generated by a *distributive operator*, ‘D’:

$$[[D]] = \lambda P. \lambda x. (\forall y \leq x) (ATOM(y) \rightarrow P(x)).$$

Suppose that the plurality referred to by the subject pronoun in (33) consists of John and Mary, where Mary is the speaker.

(33) Mary to John: We each thought we would win.

The distributive operator adjoined below ‘we’ takes as its argument the predicate predicated of the subject, John and Mary, *thinks x will win*, and applies this predicate to each of the atomic parts of the plurality consisting of John and Mary.

(33’) $(\forall y \leq \text{John} \oplus \text{Mary}) (ATOM(y) \rightarrow y \text{ thinks } y \text{ will win})$

(33) is true just in case John thinks John will win, and Mary thinks Mary will win.

If the relevant readings of (27)-(33) are distributive readings, then it *is* hard to see how the features on the embedded pronouns can be interpreted. The bound pronoun ‘we’ in (33), for example, will range over atoms, one of which (John) is not identical to the speaker.

However, it is not clear that distributive quantification *is* at work in these cases. A competing account due to Dotacil and Nilsen (*forthcoming*) (henceforth ‘D&N’) of the bound readings of (27)-(33) (which I will call, more neutrally, ‘dependent readings’, after Heim et al 1991) takes them to be instances of *cumulative* readings. To see how cumulative readings contrast with distributive readings, consider an example like (34).

(34) 600 Dutch firms own 5000 American computers.

On the distributive reading of (34), the sentence is true just in each of 600 Dutch firms own 5000 American computers apiece. On the cumulative reading, by contrast, the content of (34) can be paraphrased as follows:

There are 600 Dutch firms and 5000 American computers, and each of these Dutch firms owns at least one of those American computers, and, conversely, each of those American computers is owned by one or more of these Dutch firms.

In other words, there are 5000 American computers wholly distributed somehow or other among 600 Dutch firms in such a way that each firm owns at least one computer.

According to D&N, the dependent readings of (27)-(33) are *cumulative* readings, not distributive ones. D&N adopt the influential treatment of cumulative readings of Landman (2000), who argues that cumulative readings require an events-based semantics. In this semantics, every model contains a domain I of individuals, and a domain E of events.⁶⁶ Common nouns denote sets of individuals, while verbal predicates refer to sets of events. For example, ‘walk’ denotes the set of walking events, ‘sleep’ the set of sleeping events, and so on. ‘Participants’ of events are related to events through thematic roles, like Agent and Theme; these are captured by partial functions from events to individuals. For example, the sentence “Mary walks” denotes a subset of E containing all walking events where the agent is Mary. (The *Agent* function will map the elements of this set to Mary.)

$$[[\text{Mary walks}]] = \{e \in E \mid e \in \text{WALK} \wedge \text{Agent}(e) = \text{Mary}\}$$

$$[[\text{walk}]] = \lambda x \{ e \in E \mid e \in \text{WALK} \wedge \text{Agent}(e) = x \}$$

A sentence is considered true iff *its event-type is realized by at least one event*. Thus a sentence like “Mary walks” introduces existential quantification over event types, and the sentence is true just in case there exists some event of walking where the agent of that event is Mary.

$$[[\text{Mary walks}]] = 1 \text{ iff } \exists e \in E [e \in \text{WALK} \wedge \text{Agent}(e) = \text{Mary}]$$

Cumulative readings involve *plural* events, with plural realizers of the Agent and Theme roles. Landman’s (2000) treatment of plurals is based on the earlier account of plurality developed in Landman (1995). This account builds on Link’s (1983) mereological approach to plurality (see also Bach 1986), where pluralities are created by closing a domain of entities under the operation of *sum*

⁶⁶ Strictly, Landman’s theory is one of functional types, but (as is common) I use set theoretic rather than functional notation where it is more perspicuous.

formation. As with other mereological approaches (of the kind we have been assuming for the treatment of plural features), we assume that sums of individuals are also individuals, and thus that individuals can have other individuals as parts. In particular, the sum of two or more singular (i.e. atomic) individuals is a plural individual, and any atomic individual is a sum of itself and nothing else. The part/whole relation is defined in terms of sum formation, where a is a part of b iff the sum of a and b is b : where ‘ \oplus ’ denotes the sum-forming operator, $a \oplus b = b$ iff $a \leq b$ (Link 1983, 1998; Landman 1995, 2000).

In Landman (1995), the operation of sum formation is used not only to construct plural individuals but also plural events and plural thematic roles. A plural event is a sum of atomic events, an atomic event is a sum of itself and nothing else. Similarly, where R is a thematic role like Agent or Theme (defined for atomic individuals), the plural role R^* of a plural event is the sum of R -values of the atomic events of all its subparts.⁶⁷

$$*R(e) = \oplus (\{R(e'): e' \in \text{ATOM}(e)\}).$$

Thus the realizers of a plural thematic role like Agent^* of a plural event e will be the sum of the (atomic) agents of all the atomic subparts of e :

$$*\text{Agent}(e) = \oplus \{\text{Agent}(e'): e' \in \text{ATOM}(e)\}$$

For example, if Mary is the Agent of an event e' ($\text{Ag}(e') = \text{Mary}$) and John is the Agent of an event e'' ($\text{Ag}(e'') = \text{John}$), and e is a complex event consisting entirely of the sum of e' and e'' , the plural agent of e is the sum of John and Mary: $*\text{Agent}(e) = \text{John} \oplus \text{Mary}$.

With this background, let us turn to our problem cases e.g. (33) from above. On the events-based analysis, (33) will receive the analysis in (33'). (33') says that there exists a plural event e that is a thinking event, which has $\text{John} \oplus \text{Mary}$ as its plural agent and the structured proposition, $\langle \text{they}, \text{win} \rangle$ as its theme.

(33) Mary to John: We each think we will win.

(33') $(\exists e)(*\text{think}(e) \wedge *\text{Agent}(e) = \text{John} \oplus \text{Mary} \wedge *\text{Theme}(e) = \langle \text{they}, \text{win} \rangle)$

⁶⁷ ‘ $*$ ’ is the star operator of Link 1983, which transforms a one-place predicate P into the sum of all atoms in P .

Given what has been said, $\text{John} \oplus \text{Mary}$ will be a plural agent of a thinking event e with the structured proposition, $\langle \text{they}, \text{win} \rangle$ as its theme just in case e has sub-events e', e'' , where (i) $\text{Agent}(e') = \text{John}$, and $\text{Agent}(e'') = \text{Mary}$, and (ii) e', e'' have parts of the structured proposition $\langle \text{they}, \text{win} \rangle$ as their themes.

The first of these conditions is straightforward, but how should we understand the notion of a proper part of a structured proposition, in (ii)? The most straightforward answer, D&N propose, is that a structured proposition $\langle a', b' \rangle$ is a part of a structured proposition $\langle a, b \rangle$, iff a' is a part of a and b' is a part of b :

If $\langle a, b \rangle$ and $\langle a', b' \rangle$ are structured propositions, $\langle a, b \rangle < \langle a', b' \rangle$ iff $a < a'$ and $b < b'$.

For example, the parts of the singular proposition $\langle \text{John} \oplus \text{Mary}, \text{win} \rangle$ are the singular propositions $\langle \text{John}, \text{win} \rangle$, $\langle \text{Mary}, \text{win} \rangle$ and $\langle \text{John} \oplus \text{Mary}, \text{win} \rangle$ since each of John and Mary (taken individually) and their sum is a part of the plural sum, $\text{John} \oplus \text{Mary}$.

Given these truth-conditions, *one way* (more on this qualification below) for (33') to be true is for there to be subevents e', e'' of e , where:

(i) John is the Agent of e' , $\langle \text{John}, \text{win} \rangle$ is the Theme of e' , and John bears the *thinking* relation in e' to $\langle \text{John}, \text{win} \rangle$ (i.e. John thinks *that John will win*), and...

(ii) Mary is the Agent of e'' , $\langle \text{Mary}, \text{win} \rangle$ is the Theme of e'' , and Mary bears the *thinking* relation in e'' to $\langle \text{Mary}, \text{win} \rangle$ (i.e. Mary thinks *that Mary will win*).

This is the *dependent* reading of (33), where each of John and Mary thinks, "I will win" (or, at any rate, John thinks *John* will win, and Mary thinks *Mary* will win).

The crucial point to notice is that this way of deriving the dependent reading is compatible with the presence of interpreted features on the plural pronouns in (33): 'we' (on both of its occurrences) takes a *plurality including the speaker* (the plural sum, $\text{John} \oplus \text{Mary}$) as its value. Indeed, it is not even clear on the cumulative analysis that cases like (27)-(33) *raise the question* whether features are interpreted on bound pronouns, since the pronouns that we earlier took to be featureless bound pronouns (on the distributive analysis) can be plain referential pronouns (both occurrences of 'we' in

(33) can *refer* to the plurality, John \oplus Mary). On the other hand, if the pronouns in (27)-(33) *are* bound pronouns, each of which ranges over singleton set of values, then although interpreted features are not *required* on the pronouns in the way they would be if the pronouns were referential, the presence of interpreted features is *compatible* with the dependent reading. For example, the plural and 1st person features on the embedded occurrence of ‘we’ in (33) can be interpreted if the pronoun is bound, since the pronoun ranges over a singleton set of values consisting of a plurality including the speaker.

The cumulative account of the dependent readings of (27)-(33) thus has one important advantage over the distributive account: It is compatible with the null hypothesis that the features of bound pronouns are semantically interpreted. However, according to Heim, Lasnik and May (1991) (see also Diamatris 2000), the cumulative account has a fatal flaw: the truth-conditions it assigns to examples like (27)-(33) are too *weak*.

On the distributive analysis, (33) is true just in case each of John and Mary thinks: “I will win” i.e. the sentence has a dependent reading *only*.

(33) We each think we will win.

The cumulative analysis, by contrast, assigns less determinate truth-conditions to (33). *One* way for (33) to be true on the cumulative reading is if the sentence is true on the dependent reading, according to which there exists an event *e*, which contains a pair of subevents *e'* and *e''*, where John is the agent of *e'* and the singular proposition <John, win> is the theme of *e'*, and Mary is the agent of *e''* and the singular proposition <Mary, win> is the theme of *e''*. However, all that is strictly required for the truth of (33) is that each of John and Mary be the agent of some subevent where they bear the thinking relation to *some* part of the singular proposition <they, win>. The cumulative analysis does not specify *which* part of the singular proposition <they, win> each of agent of the subevents must bear the thinking relation to. Accordingly, if the cumulative analysis of (33) is on the right track, it should be easy – in an appropriate context – to obtain the ‘crossed’ reading represented by (33b), where each of John and Mary thinks that the other will win.

(33) We each think we will win.

a. *Dependent reading*: John thinks: John will win. Mary thinks: Mary will win.

b. *Crossed reading*: John thinks: Mary will win. Mary thinks: John will win.

According to Heim et al, only the uncrossed reading is available.

Since the cumulative analysis assigns (33) the truth-conditions represented by (33') – which is compatible with the (allegedly unavailable) crossed reading – Heim et al conclude that the dependent reading should not be tied to cumulation. If (33) *were* true on the dependent reading in virtue of having a cumulative analysis like (33'), they argue, the crossed reading should be available, which (they claim) it is not.

As D&N point out, however, crossed readings of sentences like (33) *are* available in the right circumstances. For example, the crossed reading of “We both thought that we were spies” in (35) is not only available, but *preferred*.

(35) Just about ten minutes ago I was talking to a Russian guy who was visiting his Uncle and cousin in Aktau. He is from a Russian city about 150 kilometers from the border with Kazakhstan. *We both thought that we were spies*. He was asking me if I had documents and where was I from. How did I get to Aktau... <http://www.travelblog.org/Asia/Kazakhstan/blog-6884.html>

D&N find the above example on the weblog of an American travelling in Kazakhstan. The author knows that he is not a spy, but meets people who believe that he *is* a spy. In this context, they observe, the uncrossed reading (that the author and his interlocutor each thinks: “I am a spy”) does not make sense; the only reading that is reasonable is the crossed reading (‘I thought he was a spy and he thought the same about me’).

One factor that seems to affect the availability of crossed readings is the content of the predication. The crossed readings of (36)-(38), like the crossed reading of (35), are relatively easy to hear, presumably because the uncrossed reading is in tension with natural assumptions concerning first-person authority (that one knows who one likes/is fascinated by, and who/what one is).

(36) We each thought we didn't like each other.

(37) We both thought we were fascinated by ourselves.

(38) We all assumed we were academics/Americans/tourists/British citizens.

For example, (37) has both the crossed and uncrossed reading indicated in (a) and (b):

- a. *Uncrossed*: Each of us thought: I am fascinated by myself.
- b. *Crossed*: Each of us thought: he is fascinated by himself.

Although crossed readings of examples like (36)-(38) are available, it must be admitted that such readings do appear in general to be dispreferred. For example, the non-crossed (dependent) reading of (33) is the reading most readily available in an out-of-the-blue context, whereas the crossed reading must be coerced.

One reason for the preference for the uncrossed reading, D&N suggest, is that the relation between the agent and theme of the relevant sub-events can be the identity (or an identity-based) relation. On the uncrossed reading of (33), for example, the sentence is true in virtue of the existence of a pair of events e' , e'' , where the agent of each of e' , e'' is identical to the object of the singular proposition that occupies the Theme role (the agent of e' is John, and its theme is <John, wins>, while the agent of e'' is Mary, and its theme is <Mary, wins>). By contrast, to derive the crossed reading, some *alternative* relation relating John to Mary and Mary to John but neither person to him or herself must be salient.

If this conjecture is right, we expect that crossed readings will be easier to hear in contexts of interpretation where some cross-linking relation is particularly salient. This prediction seems to be borne out, even in initially recalcitrant examples like (31)-(33) (repeated below).

Context: John and Mary are observing one another through binoculars during a sailing race:

(31) Each of us thought we would win.

(32) We each thought that we would win.

Context: John and Mary sat in on each other's job interview, and each thought the other made a good impression.

(33) You both were sure you would get the job.⁶⁸

⁶⁸ Some other examples of crossed readings:

Context: John and Mary are reading one another's essays.

(a) We both thought we had atrocious grammar.

If both crossed and uncrossed readings of examples like (31)-(33) *are* available – either when the interpretative context or the content of the predication is right – then the phenomenon of crossed readings is a problem for *distributive* rather than cumulative analyses.⁶⁹ While both crossed and uncrossed readings fall out of the cumulative analysis, proponents of the distributive analysis will need to explain crossed readings by appealing to some independent mechanism. The most obvious way to explain crossed readings is by appeal to the cumulative analysis. But if the *crossed* readings are cumulative readings, the distributive analysis of the dependent i.e. uncrossed readings looks like an uneconomical – descriptively unnecessary – addition, since the dependent readings would anyway fall out of the cumulative analysis ‘for free’ – as one kind (the most natural kind) of cumulative reading.

What we have therefore seen is that the dependent readings of examples like (27)-(33) are problematic for the null hypothesis only if we assume that they involve something like distributive quantification. The competing view that dependent readings are instances of *cumulative* readings is compatible with the presence of interpreted features on the pronouns in (26)-(31), and also has certain descriptive advantages. One advantage of the cumulative analysis is that it predicts that examples like (27)-(33) *do* have crossed readings. On the view that the dependent readings are distributive readings, by contrast, crossed readings must be accounted for by a separate mechanism.

It is also worth noting one final problem for the distributive analysis, involving the contrast in the availability of the dependent reading of pairs like those in (39)-(41). The puzzle for the distributive analysis is, first, that the (b) sentences implicate that the members of each plurality (the referents of ‘we’ and ‘they’) have one mother between them, and second, that the (a) sentences express the intended dependent plural reading *vis* that each atomic element *x* of the relevant plurality

Context: John and Mary are meeting one another’s parents.

(b) We both hoped that we would not be shown/ask to see baby pictures.

(c) We were each afraid we would mention the incident in Pasadena.

⁶⁹Notice also that if the crossed reading were excluded by the semantics (rather than dispreferred for pragmatic reasons), then sentences like the following ones would be contradictory.

(a) We each thought we would win – I don’t mean that each of us thought he himself would win, but that each of us thought that the other would win.

(b) You both thought you would win – I don’t mean that each of you thought you yourself would win, but that both of you thought that the other would win.

(a) and (b) do not feel like contradictions, however.

loves x 's mother – with no implication of siblinghood.

(39) a. They all love their mothers.

b. ? They all love their mother.

(40) a. We all love our mothers.

b. ? We all love our mother.

(41) a. We both love our mothers.

b. ? We both love our mother.

On the cumulative analysis, neither of these facts is surprising. For example, ‘our mothers’ in (40) will be taken to refer to the sum of the mothers of the atomic members of the group referred to by ‘we’. Assuming that the members of the group referred to by ‘we’ are *not* siblings, the sum of the relevant mothers will be a *plural* sum – hence, ‘our mothers’ can refer to the plural sum of the mothers of the group, while ‘our mother’ will falsely implicate one mother for all. However, on the distributive analysis, (41a) will receive an analysis like the one below, where the plural pronoun in the embedded clause [[love our mothers]] is a featureless variable bound by a distributive operator (suppose that ‘we’ refers to John \oplus Mary).

(41a') ($\forall y \leq \text{John} \oplus \text{Mary}$) (*ATOM* (y) \rightarrow y loves y's mothers)

If (41a') were the right analysis of (41a), we would expect (41a) to imply (bizarrely – outside the context of surrogacy, non-biological motherhood, and the like) that John and Mary both have more than one mother apiece, while (41b) would convey the intended meaning. Neither of these predictions is borne out. (41a) conveys that there is, in sum, more than one mother loved, while (41b) has only the unintended ‘one mother for all’ reading.

3.2.7 Fourth challenge: bound singular indexicals

Heim (2008, 43) asks, “*Can a first person singular pronoun such as I, me, myself ever be a bound variable pronoun?*” On the one hand, since all pronouns are variables on the Cooper analysis, it is possible to generate logical forms in which first person singular pronouns are bound. However, Heim observes:

...we could not possible distinguish [a bound reading of a 1st person singular pronoun] from a referential one... [since the pronoun's] features will ensure that this variable can take on only one value (x_c)" (ibid).⁷⁰

Since the presuppositions induced by the 1st person, singular features of the pronoun "will ensure that this variable can take on only one value (x_c)", the only bound readings of 1st person singular pronouns we are led to expect are ones where the pronoun ranges over a singleton set of values. A bound 1st person singular pronoun thus should not be able to take a 'truly quantificational' antecedent – one that quantifies over a non-singleton set of values.

[A] 1st person singular pronoun could not possibly have a truly quantificational antecedent, such as for example a universal or existential quantifier with a non-singleton restrictor. What would happen there is that we would generate the presupposition – impossible for a non-singleton – that each element of the restrictor is identical to [the speaker of the utterance context]. (Heim 2005a, 11)

Strictly parallel issues arise in connection with 2nd person singular pronouns, as Kratzer observes.

[While a 3rd person pronoun] could be treated as a non-trivial bound variable pronoun...this type of account cannot be extended to 1st or 2nd person pronouns. The referents of those pronouns are necessarily picked out by the utterance context, and that means that all assignments that are admissible in a context must assign the same individual to them. (2006, 3)

The fourth and final challenge to the null hypothesis is that we *do*, according to some authors, find 1st and 2nd person singular pronouns with 'truly quantificational' antecedents (Partee 1989; Rullmann 2004; Heim 2005a,b, 2008 *inter alia*; Kratzer 2006, 2008, *inter alia*). According to Kratzer, these cases present "a major challenge for unified semantic analyses of referential and bound variable pronouns":

Bound variable readings for 1st and 2nd person pronouns present a major challenge for unified semantic analyses of referential and bound variable pronouns. There seems to be no good way to give 1st and 2nd person features interpretations that could produce both indexical and bound variable readings. (2006, 2)

However, if there is "no good way to give 1st and 2nd person features interpretations that could produce both indexical and bound variable readings", then "the prospects of a common semantics for 3rd person pronouns are not good":

Whatever non-semantic account has to be invoked to solve the puzzle of pronominal ambiguity with 1st and 2nd person pronouns is likely to carry over to 3rd person pronouns.

⁷⁰ Of course, there will be structural differences between sentences involving referential pronouns and co-referential anaphors that range over a singleton set of values. On some views, such structural differences give rise to differences in the propositions expressed by sentences (cf. Soames 1989, 1994 and Salmon 1986, 2010; see Chapter 5 for discussion). However, these differences are not of a kind that concerns us here.

(ibid)

Where, then, do we find these highly problematic examples of bound 1st and 2nd singular pronouns?

As it turns out, we only find them (allegedly) in the kinds of ‘only’-DP and sloppy VP ellipsis cases we considered in §3.1.1 and §3.1.2.

(42) Only I_F did my homework.

(43) Only you_F did your homework.

(44) Sue_F did her homework. You_F didn’t. (=You didn’t do your homework.)

(45) Sue_F did her homework. I_F did, too. (=I did my homework.)

Since ‘only’-DPs are focus-sensitive operators, cases like (42)-(43) can be explained if phi-features do not contribute to the calculation of focus alternatives. Furthermore, we saw that there is independent reason to maintain that that presuppositional contents like those that phi-features contribute *can* be ignored in the calculation of focus alternatives. If this view is right, then (42)-(43) are *not* examples of 1st and 2nd person singular pronouns ranging over non-singleton sets of values. The only level at which ‘true’ quantification takes place is at the level of focus semantic values.

Similarly, with examples like (43)-(44), we observed that VP ellipsis does not seem to require full identity of verb forms. In particular, the conditions for VP ellipsis appear to be blind to differences arising at the level of semantic presupposition – suggestively, in something like the way that the conditions on focus alternatives seem blind to presuppositional dimensions of meaning.

Can the objection be framed around different examples involving 1st and 2nd person singular pronouns with truly quantificational antecedents? The main difficulty for our fourth argument against the null hypothesis is that 1st and 2nd person singular pronouns do not appear to have bound occurrences of outside focus-sensitive constructions. As I will argue in the following section, these distribution facts are a worry for proponents of purely syntactic accounts of the role of phi-features on bound pronouns. If the features of pronouns *could* be ignored under binding, then we would expect pronouns with 1st and 2nd person singular features to be bindable in the way those with 3rd person singular features are.

3.3 Problems for theories of bound pronouns as featureless variables

In the previous section, I argued that none of the main counterexamples to the null hypothesis shows the need for a purely syntactic account of the role of phi-features on bound pronouns. In each case, there is an alternative, independently motivated way of deriving the relevant, unrestricted reading that is compatible with the null hypothesis. In this section, I argue that it is instead *purely syntactic accounts* that get the descriptive facts wrong.

One reason that it is difficult to tell whether the features of pronouns are interpreted under binding is that there is often an independent, *syntactic* explanation of the availability or unavailability of bound readings. For example, the unacceptability of sentences like (46)-(47) does not provide clear evidence either for *or* against the null hypothesis.

(46) Every boy thinks I will win. (referential only)

(47) Every boy thinks you will win. (referential only).

Although (46) presupposes, bizarrely, *that every boy is identical to s_0* , it is not clear that the problem with (46) is *semantic*. The bound reading is also excluded on *syntactic* grounds, since the antecedent is 3rd person, as shown by the verb agreement.

Moreover, in cases where bound pronouns and their antecedent are associated with the *same* features, it often makes no difference whether the features of the bound pronoun are interpreted. For example, the truth-conditions of (48) are the same whether the pronoun's singular number feature is interpreted or not, since the presupposition *that every boy is atomic* is satisfied in every (typical) circumstance whatsoever.

(48) Every boy did his homework.

However, when we turn to cases like (49)-(50), the null hypothesis appears to make good predictions. Here features seem to be selected on *semantic* rather than purely syntactic grounds.

(49) The professor is in her study.

(50) Every director likes her cast.

The feminine feature on the pronouns cannot be present solely for purposes of agreement (since the

antecedent DPs are not marked for gender) and appears to make a *semantic* contribution, imposing restrictions on the values taken on by the pronoun and thereby on the reference or range of values associated with the antecedent DP.⁷¹ (50), for example, involves a domain restriction that cannot come from the quantificational antecedent, but instead appears to come from the pronoun itself. The features on the pronoun ‘her’ seem to partialize the domain of quantification to *female* directors in the way we would expect on the view that the VP inherits the partial definedness conditions imposed by the pronoun’s features.

Similarly, in contrast with cases like (46), the absence (or, at any rate, markedness) of the bound readings of the (a) sentences in (51) and (52) cannot be explained by adverting to agreement facts, since the antecedent DPs are themselves singular (as evidenced by the verbal agreement) and English DPs are not marked for gender.

(51) a. ? Every team of researchers is planning her presentation.

b. Every team of researchers is planning their presentation.

c. Every team of researchers is planning its presentation

(52) a. ?Every group thinks she will win.

b. Every group thinks they will win.

c. Every group thinks it will win.

The bound readings of the (a) sentences appear to be marked or absent for *semantic* reasons – that is because (51a) and (52a) presuppose that every group or team is female (where teams or groups are presumably not gendered even if their members are).

Similarly, whereas (particularly in contemporary English) the plural pronoun ‘they’ or ‘their’ can often be used in place of a singular, gender-marked pronoun in cases where a quantifier ranges over a set of individuals of different genders or unknown genders (cf. (53)), the bound reading of

⁷¹ One way to explain the role of the features on the pronoun ‘her’ in (49) which does not require that anaphors (in addition to referential pronouns) carry interpreted features is to maintain that the pronoun is not truly an anaphor when its features are interpreted – that the ‘antecedent’ description plays a merely reference-fixing role for the pronoun (perhaps serving to ‘complete’ the character of the true demonstrative). Whatever the merits of this explanation of the role of features in (49), however, it does not extend to examples like (50), where the antecedent is a quantifier with (we may suppose) a non-singleton domain.

(54) is slightly odd, in comparison with (55).

(53) Every student did their homework.

(54) ?Every boy did their homework.

(55) Every boy did his homework.

The explanation is presumably meaning-based (though not *semantic*, if the plural feature triggers an implicated presupposition), involving competition between the forms in (54) and (55): given that the quantificational domain consists only of atomic individual boys, there is a preference for (55) (which could perhaps be explained via *Maximize Presupposition*, from Chapter 2). Consequently, choosing (54) implicates (perhaps, *triggers an implicated presupposition that*) every boy is a plurality.

A particularly striking set of cases in which the features of anaphors must be selected on a semantic rather than syntactic basis involve the phenomenon of ‘deferred reference’ (Nunberg 1995; Pollard and Sag 1994; Adger and Harbour 2008, 16). In cases like (56) and (57), the features of the pronouns do not merely differ from, but actually *disagree* with, the features of their antecedents. For example, the plural pronoun ‘their’ in (57) takes a *singular* antecedent, ‘table six’.

(56) The hash browns at table six wants/*want her/*his/*their cheque.

(The woman at table six, who ordered the hash browns, wants her cheque.)

(57) Table six want/*wants their/*its cheques done separately.

(The customers at table six want separate cheques.)

The features of the anaphors in (56)-(57) seem clearly to be chosen on a semantic basis. For example, the choice of ‘their’ in (57) reflects the (deferred) value of the antecedent, ‘table six’ (the group or plurality of individuals at table six).

Another interesting set of cases that has received significant discussion in the literature involves the phenomenon of ‘partial binding’. In cases like (58)-(60), the embedded pronoun occupies a structural position in which binding can occur, and its values vary with the values of the QP. However, the values of the pronoun are not exhausted by the values of the QP; the plural pronoun ranges over a set of values determined partly deictically and partly through binding relations

(Partee 1989; Rullmann 2004; Schlenker 2004, 2007; Heim 2008). As Schlenker observes, if “the index we give to the plural pronoun is free... we miss the dependency between the pronoun and the quantifier(s)”, while if the index is bound, we miss the dependency of the pronoun on the context of utterance since “the denotation of the pronoun [would then be] fully determined by the closest quantifier it is co-indexed with” (2007, 2).

(58) Every boy₃ told Mary₅ that they_[3,5] should get together.

(59) After we broke-up, only you_A wanted us_[S,A] to be friends.

(60) Only you_A brought a handout to our_[S,A] first meeting.

A natural view of cases like (58)-(60) is that the features on the pronoun are not simply syntactically determined agreement features but are determined semantically on the basis of the alternate values that the pronoun ranges over.⁷²

⁷² One response that proponents of the feature transmission theory have offered to cases of partial binding like (58)-(60) (Schlenker 2004, further developed in Heim 2008) is that partial binding occurs when pronouns originate with multiple indices, some of which get bound, while others remain free. Indices that are bound inherit their features by transmission from their binders (and inherit their values via binding relations), while free indices have base-generated features (and are assigned values by the contextual assignment function). In (58), for example, the pronoun ‘they’ is said to have an index (denoted ‘3’), which is bound by ‘every boy’, and another index that is free (or bound by the referential antecedent, ‘Mary’). Likewise, the pronoun ‘our’ in (60) has as a free index and one bound by ‘only you’:

(58) Every boy₃ told Mary₅ that they_[3,5] should get together..

(60) Only you_A brought a handout to our_[S,A] first meeting

On this view, a pronoun bearing *n* indices denotes, relative to an assignment, the *sum* of the assignments to each of its indices.

$[[\text{pro}_{i_1, \dots, i_n}]]^{cs} = s(i_1) \oplus \dots \oplus s(i_n)$. (Schlenker 2007)

The features of the pronoun are computed from its base-generated and transmitted features according to the following (allegedly) *syntactic* rules. (The PFS rule is from Heim (2008, 54). The analogous NFS rule is a simple extension of her strategy.)

Person Features for Sums (PFS)

- (i) If *i* or *j* is underspecified for person, then leave $i \oplus j$ unspecified.
- (ii) Otherwise, if *i* or *j* is first person, then specify $i \oplus j$ as first person.
- (iii) Otherwise, if *i* or *j* is second person, specify as second.
- (iv) Otherwise, specify as third.

Number Features for Sums (NFS)

- (i) If *i* or *j* is underspecified for number, then leave $i \oplus j$ unspecified.
- (ii) Otherwise, if *i* or *j* is plural, then specify $i \oplus j$ as plural.
- (iii) Otherwise, if *i* or *j* are both singular and $i \neq j$, specify as plural.
- (iv) Otherwise, specify as singular.

In the logical representation of (60), (60*) below, the index 1 on the partially bound pronoun ‘us’ is bound, and so it is initially featureless. The index 3 is free, and starts out with 1st person and singular features.

(60*) Only sg-2nd 1[t₁ brought a handout to $\emptyset_{[1: \emptyset] \oplus [3: \text{sg-1st}]}$ first meeting]

$g_c(3) = \text{Mary}$; $g_c(1) = \text{addressee of Mary}$

In cases of partial binding, the values of the plural pronoun are not *exhausted* by the values the antecedent quantifier ranges over. There is an additional, contextual contribution to the value of the pronoun. By contrast, examples like (61)-(62) have readings on which the singular pronouns range over atomic parts of the pluralities that the antecedent quantifier quantifies over.

Scenario: A couples' ice-skating competition, where each pair consists of one female and one male skater.

(61) Every pair thought she would land her jump.

(62) Every pair hoped her performance would help them win.

Both the gender and the number features play a constructive semantic role in establishing the value of the bound pronoun in relation to the values quantified over by its antecedent.

Cases like (49)-(62) are problematic for purely syntactic accounts of the features on bound pronouns like feature deletion and transmission accounts – but they are not equally problematic for

After semantic interpretation, 2nd person and singular number features are copied to the bound index by the feature transmission operation. Features are then computed by the PFS and NFS rules. By the PFS rule – specifically, clause (ii) – a pronoun with an index bearing a 1st person feature and an index bearing a 2nd person feature is 1st person. By NFS, clause (iii), a pronoun with two (or more) indices taking distinct values is plural.

Features for Sums rules are intended to show that partial binding is compatible with the feature transmission theory, and involves “two separate processes” — a process of feature transmission “which targets individual variables and therefore only affects an embedded subpart of the pronoun [and]... an operation that computes features for a complex pronoun on the basis of the features of its parts” (Heim 2005a, 29).

As Heim observes, one worry about the Features for Sums rules is that they are an ad hoc device for replicating predictions that would result from taking pronoun features to be semantically interpreted – predictions that would fall out of the semantics of pronoun features ‘for free’.

The PF operation in [PFS] largely duplicates predictions that we would already be making without it if all the person features on split-bound pronouns were freely base-generated and semantically interpreted. (Heim 2008, 54)

A second – perhaps more fundamental problem – is that these rules have an underlying semantic basis. They ‘transparently reflect’ the semantics of features, as Rullmann observes.

[A]greement between a pronoun and its binder(s) is not simply a matter of copying or matching features; instead, it transparently reflects the semantics of person and number. (Rullmann 2004, 166)

For example, agreement requires that the anaphor in (60) have a 1st person feature:

(60) Only you brought a handout to our first meeting.

What about the plural number feature? NFS *stipulates* that the pronoun must be plural – but where does this requirement come from? It cannot be purely agreement-based, since singular DPs can bind plural pronouns. (e.g. “Every team thought they would win”). It instead seems to be motivated by considerations reflecting the semantics of number features. Specifically, the Features for Sums rules appear to be specified in such a way that *presupposition failure* is avoided: a singular feature on the partially bound pronoun would induce a false semantic presupposition that the alternate values of the pronoun are atomic.

Of course, a more fundamental problem is that even if this approach to partially bound pronouns is successful, the success is local. For example, it is not clear how to deal with cases like (61)-(62) in the main text, where the pronouns ranges over *proper parts* of the values quantified over by their antecedents (rather than the antecedents ranging over proper parts of values of the anaphors).

both kinds of view. According to the feature deletion theory, bound pronouns originate with interpretable features, which can then be deleted under an agreeing subject (Sag 1976; Heim 1994; von Stechow 2002, 2003). However, since deletion requires the presence of agreeing feature, feature deletion does predict that the features of the bound pronouns in examples like (49)-(62) *will* project presuppositions, since none of these are cases where the pronouns and their antecedents have matching features. For example, since the QP ‘every director’ in (50’) does not have a feminine feature (English DPs do not encode gender), feature deletion *does* predict the presupposition *that every director is female*. Similarly, since the QP ‘every pair’ in (62’) is grammatically singular and unmarked for gender, feature deletion also predicts the presupposition *that every pair contains a female member*.

(50’) every director 5[t₅ likes 3rd-sg-fem₅’s cast]

(62’) every pair 4[t₄ hoped 3rd-sg-fem₄’s performance would help 3rd-pl₃ win]

By contrast, cases like (49)-(62) raise two separate challenges for the feature transmission theory. The first challenge is that the features on the bound pronouns in (49)-(62) *cannot* simply be copies of matching features on their binders (mere surface features passed to the pronoun by its binder after semantic interpretation takes place), since the binders have different (and in some cases *disagreeing*) features. The second challenge is to explain not merely the surface appearance of these features but the fact that they seem to be interpreted. According to the feature transmission theory, bound pronouns originate without interpretable features (as minimal or ‘zero’ pronouns), and acquire their features *after* semantic interpretation takes place. Accordingly, bound pronouns should not possess features at a stage where they can be interpreted – as those in (49)-(62) apparently are.

However, *both* the feature deletion and transmission theories face a serious problem of motivation. There are several aspects to this problem. On the one hand, cases like (49)-(62) show that bound pronouns cannot *systematically* be treated as featureless variables. Feature deletion theory can accommodate this observation, since proponents of that view advocate a *qualified* rejection of the null hypothesis: bound pronouns only lack interpreted features when they are bound by an agreeing subject. By contrast, the feature transmission proposal is reminiscent of Kaplan’s semantics in that

bound and referential pronouns correspond to two fundamentally different semantic types of expression: there is “a non-standard, two-way division of pronouns into referential pronouns and minimal or ‘zero’ pronouns”, where minimal pronouns originate without phi-features (with ‘empty feature sets’), which are the copied to them from their binders after semantic interpretation takes place (Kratzer 1998, 16).

The problem for feature deletion theory, however, is that there are also no clear cases that demonstrate the *need* for uninterpreted features on bound pronouns. As we saw in §4.1, each of the four alleged counterexamples to the null hypothesis can be explained in ways that do not *require* a mechanism like feature deletion. But the problem is in fact more serious than this. The mechanism of feature deletion does not provide an adequate account of the allegedly featureless readings from §4.1.

Consider the following variants on the ‘only’-DP cases from §4.1.1 (the ‘first challenge’).

Scenario: The Linguistics Department at the University of Enlightenment has a number of faculty members; each with a spouse, some of the spouses are females and some are males. It happens that Bill’s spouse is a woman, Betty.

For the departmental Christmas party, every faculty member was encouraged to bring their (his or her) spouse.⁷³

(63) But only *Bill* brought her.

Paraphrase: No one else brought their spouse, regardless of the gender of the spouse.

(Heim (pc), citing Jacobson)

(64) *Betty to Bill*: Only *we* thought that I would have a good time.

Paraphrase: Bill (faculty) and his spouse, Betty, thought that Betty would have a good time, but no other faculty/spouse pair thought that the spouse of the faculty member would have a good time.

(65) *Sarah to colleague*: Only *we* thought that he would have a good time.

Paraphrase: Sarah (faculty) and her spouse, Bill, thought that Bill would have a good time, but no other faculty/spouse pair thought that the spouse of the faculty member

⁷³I borrow the set-up of the case from Jacobson.

would have a good time.

These cases are like our original ‘only’-DP cases in that the features of the pronouns *again* do not partialize the domain of quantification in the way that one would expect if the features on the bound pronouns were interpreted (assuming, for the sake of argument, that these readings are *not* derived via quantification over focus alternatives). For example, (63) is true just in case Bill brought his spouse and no other faculty member brought his or her spouse regardless of the gender of the spouse. The features of ‘her’ do not partialize the domain of quantification to *females*.

(63) But only BILL brought her.

On the one hand, this set of cases appears to involve the same kind of phenomenon witnessed by examples like (6)-(8) (repeated below), and it seems plausible that whatever process accounts for the unrestricted readings in the one set of cases will account for the unrestricted readings in the other. On the other, deletion and transmission theories maintain that the quantificational readings of (6)-(8) result when the embedded pronoun is bound and either originates as a minimal or ‘zero’ pronoun or has its features deleted under agreement.

(6) Only Sue_F did her homework. (John didn’t do his homework.)

(7) Spoken by Sue: Only I_F did my homework. (John didn’t do his homework.)

(8) Only they_F did their homework. (John didn’t do his homework.)

The difficulty is that the unrestricted readings of (63)-(65) cannot be accounted for in the same way, since there is no agreement relation in (63)-(65) that licenses transmission *or* deletion. The visible features on the pronoun ‘her’ in (63), for example, cannot have been transmitted to the pronoun through an agreement chain, since there is no agreeing antecedent; for same reason (because there is no agreeing antecedent), the fact that the pronoun ranges unrestrictedly over the set of spouses cannot be explained by deleted features. Consequently, if we follow these accounts of the unrestricted readings of (6)-(8), we seem to require fundamentally different explanations of these two kinds of cases. Thus feature deletion and transmission proposals do not seem to be adequate to the

full complement of ‘only’-DP cases.⁷⁴

A similar problem arises for feature deletion and transmission theories in connection with the sloppy VP ellipsis cases from §4.1.2 (the ‘second challenge’). According to the feature deletion and transmission theories, sloppy VP ellipsis in cases like (18)-(19) (repeated below) is permitted because the features on the pronouns are either deleted under agreement, or else the pronoun originates as a zero pronoun. In either case, the antecedent VP will denote the total function, $[\lambda x. x \text{ didn't } x\text{'s homework}]$, which can be straightforwardly copied into the ellipsis site.

(18) They_F did their homework. Sue_F did, too. (=Sue did *her* homework.)

(19) I_F did my homework. You_F didn't. (=You didn't do *your* homework.)

These explanations of the sloppy reading of (18)-(19) look considerably less attractive in the context of examples like (66) below. Suppose that Sally's spouse is male.

For the departmental Christmas party, every faculty member was encouraged to bring their (his or her) spouse.

(66) BILL brought her. Sally didn't. (=Sally didn't bring him.)

Since there is no agreement relation to license the deletion or transmission of features on the sloppy pronoun in an example like (66), neither of these accounts predicts the sloppy reading on which the elided sentence is true if Sally brought *him* (Sally's spouse, Bill). Again, however, it is natural to want to explain these cases in a similar way; presumably, whatever explains the fact that sloppy VP ellipsis is licensed in (66) will also explain why it is licensed in (18)-(19).

⁷⁴ Of course, it is not entirely clear, on the alternative focused-based account from earlier, how these focus semantic values are generated. One option is to treat ‘her’ as a referential pronoun and to rely heavily on pragmatic factors to narrow a set of alternatives to the proposition *that Bill brought Akiko* (if Akiko is Bill's spouse) to propositions of the form *x brought y* where *x* is a faculty member and *y* is a spouse. Alternatively, Jacobson proposes that ‘her’ is a *paycheck pronoun*. A paycheck pronoun is not an ordinary bound pronoun or a free pronoun, but has a complex meaning consisting of a contextually-supplied relation and a bindable element (a variable or – in a variable-free theory like Jacobson's – argument slot). In the case of (63), Jacobson proposes that ‘her’ denotes a function that maps each individual *x* to the value of a function like *spouse-of*, where the features of the pronoun restrict the range of the function to *females*. The focus value of the pronoun is the corresponding non-restricted *spouse-of* function:

$[[\text{BILL brought paycheck- her}]]^o = \lambda f_{\text{range fem}} \text{Bill brought } f]$

where $f = \text{spouse-of: Bill } \lambda x. x \text{ brought } \text{spouse-of } x$ (restricted in range to female spouses)

$[[\text{BILL brought paycheck-her}]]^i = \lambda f \{ \{ \text{bill brought } f, \text{ tom brought } f, \text{ sally brought } f, \dots \} \}$

Notice that, even on the paycheck analysis, the features of the pronoun have a role to play, restricting the range of the paycheck function corresponding to the ordinary semantic value of the pronoun.

Furthermore, as we observed in §3.1.3 (the ‘third challenge’), deletion and transmission theories struggle to account (given the distributive analysis of (67)-(69)) for the availability of *crossed* readings of examples like (67)-(69), involving plural pronouns under floated quantifiers:

(67) We each thought we would win/were spies/didn’t like each other.

(68) We both thought we had atrocious grammar/were arrogant.

(69) Each of us thought we would get the job/weren’t listening/were tourists.

By contrast, these readings fall out naturally from a cumulative analysis.

We also saw that deletion and transmission accounts do not explain the contrast between the pairs in (40)-(41) (repeated below).

(40) a. We all love our mothers.

b. ? We all love our mother.

(41) a. We both love our mothers.

b. ? We both love our mother.

This contrast *is* explained on the face value theory that ‘our’ is a plural (referential or bound) pronoun, and ‘our mothers’ denotes the plural sum of the mothers of the atomic elements of that plurality

The final and most substantial problem for purely syntactic accounts arises in connection with the fourth challenge to the null hypothesis, involving singular indexical pronouns with ‘truly quantificational’ antecedents). The main problem here is that there *are* no clear examples of anaphoric constructions of this kind. On the one hand, ‘only’-DPs and VP ellipsis cases provide very weak grounds for maintaining that 1st /2nd person singular pronouns can be bound by truly quantificational antecedents. On the other, despite the fact that such cases have been extensively discussed, no one has yet succeeded in showing that unrestricted quantificational readings involving 1st and 2nd person singular pronouns arise outside focus-sensitive constructions.⁷⁵

⁷⁵ The only other putative examples of bound 1st and 2nd person pronouns that I am aware of are examples like (a)-(c), where 1st and 2nd person pronouns occur in constructions with quantificational adverbs such as ‘always’, ‘usually’, ‘rarely’, ‘traditionally’, etc.

These distribution facts should worry proponents of the view that bound pronouns do not have interpreted features. In Chapter 2, we observed that the behavior of 3rd person pronouns is not correctly described by the generalization that a 3rd person pronoun must refer to a salient entity in the utterance context c distinct from s_c or a_c . The requirements on the values of 3rd person pronouns are less stringent than this, *indexical* view of their meanings suggests, since 3rd person pronouns can refer to or range over values including s_c or a_c . As a consequence, most authors are disinclined to treat 3rd person features in the same way as 1st and 2nd person features – and, in particular, reluctant to semantically encode the requirement that a 3rd person pronoun refer to an individual distinct from s_c or a_c as a *semantic* requirement.

However, if 3rd person pronouns can refer to or range over sets of individuals including s_c and a_c because they are not semantically associated with person features that tie their interpretations to the utterance context, then there is a simple explanation of the contrast in the availability of bound readings of 3rd person pronouns in contrast with 1st and 2nd person pronouns. Whereas the indexical features of 1st and 2nd person pronouns impose requirements on their interpretations that are incompatible with the requirements on bound pronouns with truly quantificational antecedent, 3rd person pronouns are not so constrained, and thus can take on the alternate values of their antecedents, rather than contextually supplied values. However, this natural explanation of the contrast in the availability of bound readings of 3rd person pronouns, on the one hand, and 1st and 2nd person pronouns, on the other, assumes that the features of bound pronouns *are* interpreted. If there were mechanisms associating with binding that could cancel out the requirements that features

(a) Condemned prisoner : I am traditionally allowed to chose my last meal.

Paraphrase: Condemned prisoners are traditionally allowed to choose a last meal.

(b) Chess teacher instructing a student: According to the textbooks, you rarely succeed with that move.

Paraphrase: Few chess players who make that move succeed with it.

(c) Uttered by John Paul II: I am usually Italian.

Paraphrase: Most popes are Italian.

The first point about these cases that it is not clear that the 1st and 2nd person pronouns are true bound pronouns. The second point is that the 1st and 2nd person features make *some* contribution to deriving the relevant readings. For example, (a) expresses a generalization on the basis of the properties of the speaker (a generalization about condemned prisoners). While various analyses have been proposed for these cases (see Nunberg 1993, Elbourne 2008a, Hunter 2010), they are unified in assigned the features of the pronoun *some* role.

impose on the values of pronouns, then we would not expect it to be any more difficult to bind a 1st or 2nd person pronoun than a 3rd person pronoun. There would then be no competition between feature-imposed requirements on 1st or 2nd person pronouns and those imposed by anaphoric relations to truly quantificational antecedents, and bound readings of 1st and 2nd person pronouns should be more freely available than they are.

There are different ways to argue against a semantic theory of some phenomenon. One way is to show that the theory fails to predict interpretations that *are* unavailable – in the way e.g. the feature transmission theory fails to predict the restricted quantificational readings of (49)-(62). Another is to show that the theory predicts interpretations that are *unavailable*. The distribution of bound 3rd person pronouns, on the one hand, and those with 1st and 2nd person features, on the other, raises a problem of the second kind – for deletion and transmission theories alike. Whereas the evidence against the null hypothesis amounts to a small collection of inconclusive cases, the (uncontested) global facts concerning the distribution of bound singular 1st and 2nd person pronouns, on the one hand, and bound 3rd person pronouns, on the other, are precisely what we would expect them to be if the null hypothesis is correct and the features of bound pronouns are interpreted.

3.4 Summary and conclusions

In the previous chapter, we saw that Kaplan's semantics treats bound and referential pronouns as homonyms. The semantic values of bound pronouns are exhausted by their values under varying assignments, while referential pronouns are associated with characters, functions from contexts to contents. As we have seen, a variety of semanticists *also* subscribe to a version of the view that bound pronouns are fundamentally semantically different from referential ones. According to Kratzer, there is a 'puzzle of pronominal *ambiguity*' (2006, 2; emphasis added). The puzzle is why bound pronouns and referential pronouns should "look the same" in spite of the important semantic difference between them *vis* that bound pronouns do not have interpreted features (*ibid*).

In this chapter, I have argued that there is no ‘puzzle of pronominal ambiguity’. While there are no clear cases that demonstrate that bound pronouns *lack* interpreted features, there are abundant cases that are either consistent with or demand that their phi-features play a semantically constructive role. Bound pronouns are not simply bound variables, their values exhausted by their assignments, while referential pronouns have assignment-independent levels of meaning. Bound pronouns are associated with feature-induced presuppositions on their assignments strictly analogous to the feature-induced presuppositions on contextual assignments to referential pronouns. Bound and referential pronouns alike are “real, meaning bearing elements of language” (Kaplan 1989b, 593).

The previous chapter ended on a promissory note: to provide further evidence that pronominal phi-features project in bound constructions, interacting with operators and quantifiers in semantically constructive ways. The systematic interactions we have seen between pronominal phi-features and quantificational operators in this chapter deliver on this promise. In a wide variety of cases (perhaps, in *all* cases), the phi-features of bound pronouns project in bound constructions, imposing restrictions on assignments of values to bound pronouns and, when the pronoun is bound by a quantifier, the domain that the quantifier quantifies over.

Strictly, the argument for Cooper’s semantics – and for a unified semantics for bound and referential pronouns, more generally – depends on a weaker thesis than the thesis that pronominal phi-features are *always* semantically interpreted on bound pronouns (i.e. that there are no semantically inert bound pronoun features). In particular, it suffices to show that the features of bound pronouns *typically* project – perhaps, that they project when there is no construction-specific obstacle to their projection. However, in arguing that there are no clear cases where bound pronouns lack interpreted phi-features, I have (indirectly) argued for the stronger thesis that pronominal phi-features are *always* semantically interpreted. In each of the cases we considered, there is a plausible alternative account of the ‘featureless’ (i.e. unrestricted quantificational) reading. It should be noted, however, that if some further data show that this stronger claim is false – that, for construction-specific reasons, the semantic contributions of the features on some bound pronouns are suppressed – these data will not

thereby show that bound and referential pronouns correspond to fundamentally different semantic types of term. If phi-features typically or usually play a semantic role analogous to their role on referential pronouns, restricting assignments of value to the variable in the logical form of the pronoun (whether that variable is free or bound), then referential and bound pronouns cannot be mere homonyms. It is an important empirical advantage of Cooper's semantics that it permits us to capture the two uses of pronouns under a single semantics, reconciling their variable-like behavior with their assignment-independent semantic values.

4. Taking the ‘D’ out of ‘donkey’: Some problems for D-type accounts of donkey anaphora

4.0 Introduction

In the previous chapters, I argued that Cooper’s semantics successfully accommodates bound and referential pronouns, reconciling the traditional view that anaphoric pronouns correspond to bound variables with the apparent non-homonymy of bound and referential pronouns. Notwithstanding these successes, there remains a class of pronoun uses that are widely believed to require a departure from the Cooper semantics for pronouns and, more generally, from the view that anaphoric pronouns “strictly correspond” to (classical) bound variables (Geach 1972, 12-13). This chapter is about *non c-command anaphora*, and about *D-type* accounts of their semantics.

In a series of important papers on pronominal anaphora (Evans 1977a/b, 1980), Evans warns against being overly impressed by the analogies between anaphoric pronouns and bound variables:

Certain logically-minded philosophers have been so impressed by the undoubted analogies which exist between some pronouns and the bound variables of quantification theory that they have enthusiastically adopted the hypothesis that *all* natural language pronouns with quantifier antecedents are bound by those antecedents. (Evans 1980, 344)

Evans observes that if there were a strict correspondence between natural language pronouns with quantifier antecedents and the bound variables of quantification theory (as the ‘logically-minded philosopher’ Geach maintains), then the anaphoric relations between pronouns and their antecedents would be limited by *scope*, in the way that the relations between classical bound variables and their binder are.⁷⁶ What, then, Evans asks, are we to make of examples like (1)-(3)?

(1) Every farmer who owns a donkey feeds it.

(2) If a farmer owns a donkey, he usually feeds it.

⁷⁶On standard logical accounts, the scope of a formula is the whole complex formula including the operator itself. For example, the scope of ‘&’ in ‘P & Q’ includes ‘&’, and not just what it is operating on. By contrast, the scope of a variable binder in natural language is the part of a formula that the operator operates on.

(3) Harry owns some sheep. John vaccinates them. (Evans 1977a, 470)

On the one hand, there is a great deal of empirical evidence that suggests that the scope of a natural language operator corresponds to its c-command domain (Reinhart 1976, 1983).⁷⁷ Quantifiers do not scope out of relative clauses (cf. (1)), out of the antecedents of conditionals (binding variables in their consequents) (cf. (2)), or beyond sentential boundaries (cf. (3)).⁷⁸ Consequently, the occurrences of the pronoun ‘it’ in the subordinate clauses of (1) and (2) and the occurrence of ‘them’ in the subsequent sentence in (3) cannot be (classically) bound by the indefinites ‘a donkey’ and ‘some sheep’; these quantifiers (if that is what they are⁷⁹) do not c-command the pronouns. On the other hand, (1)-(3) *do* have anaphoric interpretations, where the values of the pronouns co-vary with the values of the indefinites. For example, (1) has a co-varying reading, expressible in first order logic as (4), which apparently requires that the pronoun range over the various donkeys owned by the relevant set of farmers.

(4) $\forall x \forall y ((\text{farmer}(x) \wedge \text{donkey}(y) \wedge \text{owns}(x, y)) \rightarrow \text{feeds}(x, y))$.

⁷⁷ The c-command thesis, as originally articulated by Reinhart (1976, 1983), is that the semantic scope of an operator coincides with its syntactic domain.

The semantic scope of a linguistic operator coincides with its domain in some syntactic representation that the operator is part of. (Szabolcsi 2010, 18)

The syntactic domain of an operator is its *c-command domain* (the ‘nodes’ that the expression c-commands), where a node α c-commands a node β iff (i) neither node dominates the other, and (ii) the first branching node dominating α dominates β (Heim and Kratzer 1998, 261).

As Schlenker (2008) observes, the reason that donkey sentences are both important and puzzling is that they both appear to be exceptions to the c-command thesis, yet are minimally different from cases that appear to confirm it, like (a) and (b).

(a) # A man who owns every donkey feeds it.

(b) # If John owns every donkey, he feeds it.

The pronoun in (a) occupies a relative clause (an ‘island’ (Ross (1976) for syntactic movement) and cannot therefore raise up at LF (quantifier raising) to occupy a position from which it can bind the pronoun. As a result, it is expected that the quantifier phrase ‘every donkey’ will not be able to bind the pronoun ‘it’, generating a covarying reading on which (roughly) every donkey is such that a man who owns it feeds it. This prediction appears to be borne out – (a) does *not* have a covarying reading. Compare this with example (1), main text, which *does* have a covarying reading, although the indefinite ‘a donkey’ also does not c-command the pronoun ‘it’ either at the surface level or (since the indefinite again occupies a relative clause) at LF.

⁷⁸ Furthermore, even if the indefinites could take scope over the pronouns and bind them, we would end up with the wrong truth-conditions. For example, if ‘a donkey’ in (1) *were* somehow to raise up to c-command ‘it’, (1) would come to mean that *some donkey is such that every farmer who owns it feeds it*.

⁷⁹ On dynamic theories such as Kamp (1981) and Heim (1982), indefinites are not quantifiers but are instead expressions that introduce novel discourse referents.

According to Evans, these non c-command or “donkey anaphors” (after similar examples in Geach 1962) do not correspond to the *bound* variables of classical logic.⁸⁰ At the same time, since they are *anaphors*, they also do not correspond to *free* variables (like referential pronouns). Consequently, Evans concludes, there are some uses of pronouns that do not conform to the classical model of the variable, *pace* Geach.

If the donkey anaphor ‘them’ in (5) ((3), from above) is not a (classically) bound variable and it does not refer, then what is its semantics?

(5) John owns some sheep. Harry vaccinates them.

There are two main accounts of the semantics of donkey anaphors. My main concern will be *D-type theories*, which descend from Evans’ own proposal. As Evans observes, there is a close relationship between the semantic contributions of donkey anaphors like the one in (5) and definite descriptions, like ‘the sheep which John owns’:

“What *is* [the anaphor’s] designatum – its semantic extension?”,

If someone asked, ‘Harry vaccinates *them*? Which sheep?’, the natural... answer is: ‘*The sheep which John owns*, of course’. (1977a, 474)

According to D-type theories (Cooper 1979; Heim 1990; Neale 1990a 1990b; Heim and Kratzer 1998; Elbourne 2001a, 2001b, 2005; Buring 2004), donkey anaphors are (or have their references fixed by) descriptions – typically, *definite* descriptions like ‘the sheep which John owns’.⁸¹

⁸⁰ A word about terminology: The term ‘E-type anaphor’ is sometimes used (in an extended way) to describe any anaphoric pronoun that falls outside the c-command domain of its antecedent. However, Evans (who introduced the term) reserves ‘E-type anaphor’ for a pronoun like ‘it’ in (1) which is anaphoric on, but not c-commanded by, a *quantificational* antecedent. Furthermore, the term ‘E-type’ is also associated with the particulars of Evans’ (1977a/b, 1980) analysis of donkey pronouns. To remain faithful to Evans’ original usage (and avoid associations with his positive proposal), I’ll use ‘donkey anaphor’ for the wider class of non c-command anaphors. Other terms commonly used for non c-command anaphors are ‘D-type anaphor’ and ‘unbound anaphor’. These are somewhat unfortunate in that they build in specific theoretical commitments. ‘D-type’ suggests that the anaphors are to be analyzed as descriptions, as on D-type theories, while, on some accounts, so-called ‘unbound anaphora’ *are* semantically bound by their antecedents or by higher quantifiers. Although the views I explore hold that donkey anaphors are syntactically and semantically unbound, the terminology, at least, should be neutral on this issue.

⁸¹This is a departure from the terminology in Elbourne (2005), where ‘D-type theories’ are identified with views on which donkey anaphors are equivalent to definite descriptions. I use ‘D-type’ to characterize *any* ‘description-theoretic approach’ (Elbourne 2005, 5) to donkey anaphors, on which descriptions play a crucial role in the semantics of donkey pronouns. In particular, I include Evans’ E-type theory as a D-type theory. As I later discuss, Evans’ proposal departs from standard D-type theories in taking donkey anaphors to be expressions that have their references *fixed* by descriptions (this, at any rate, is how Evans’ characterizes his

Dynamic theories represent the second main approach to donkey anaphora. Whereas D-type theories of donkey anaphora abandon the model of the variable for donkey anaphors and retain the notion of the scope of a variable binder inherited from classical logic, dynamic theories retain the idea that pronouns are variables but revise the classical notion of scope, permitting donkey anaphors to be semantically bound by operators or higher quantifiers that do not (syntactically) take scope over them.⁸²

I will not be *directly* concerned with dynamic theories in this chapter. Instead, I ask what the semantics of donkey anaphors must be like *if the classical model of binding and quantification is retained*. I begin in §4.1 by outlining a representative pair of D-type theories: the D-type theory of Cooper (1979) and a recent proposal due to Elbourne (2001a, 2001b, 2005). Cooper’s proposal represents a traditional approach to donkey anaphora, where donkey anaphors co-vary with their antecedents by individual variable binding. On Cooper’s analysis, donkey anaphors correspond to open definite descriptions composed of a contextually supplied relation and an individual variable. By contrast, Elbourne’s proposal represents a more recent approach, based on the idea that donkey anaphora involves quantification over situations in the sense of Kratzer (1989) (rather than individuals) (Heim 1990, Elbourne 2001a, 2001b, 2005, Büring 2004). According to Elbourne, donkey anaphors are definite articles that compose with deleted NPs to yield definite descriptions, which covary with their antecedents by situation variable binding.

While I will not be directly concerned with dynamic theories of donkey anaphora, the arguments presented in §4.2 and §4.3 of this chapter *indirectly* bear on important questions concerning the relation between the dynamic and D-type treatments of donkey anaphora. Elbourne’s D-type proposal appears to solve a number of important problems for traditional D-type theories like Cooper’s, including the particularly intractable problem of the *indistinguishable participants*. However, I

view; for a different characterization, see §4.3). Thus D-type theories here include views on which descriptions go proxy for donkey anaphors and those on which they play a merely reference-fixing role.

⁸² The main dynamic semantic theories are *discourse representation theory* (Kamp 1981, Heim 1982), and *dynamic predicate logic* accounts (Groenendijk and Stokhof 1991, Chierchia 1995). An approach closely related to dynamic predicate logic is Veltman’s *update semantics* (1991).

argue in §4.2 that *if* Elbourne's solution to the problem of indistinguishable participants succeeds, it has important implications for the other aspects of his theory (in particular, his NP-deletion account) and, more generally, for the way that static semantic theories account for the covariation between donkey anaphors and their antecedents. In particular, it shows that the descriptive resources D-type theories characteristically appeal to – antecedent recovered or contextually supplied descriptive contents – are inessential to capturing donkey anaphoric readings, and in certain cases, prove to be empirically problematic. Instead, the descriptive contents of donkey anaphors must be rather minimal contents of a kind characteristically associated with dynamic theories. In §4.3, I turn to an objection Evans (1977a) raises against D-type theories of donkey anaphora concerning differences in the scope interactions of donkey anaphors and definite descriptions. I argue that a version of Evans' objection survives the response in Elbourne (2005), and moreover shows – as Evans maintains – that that donkey anaphors are not semantically equivalent to *definite descriptions*.

What then must the semantic denotations of donkey anaphors be like, if donkey anaphors are not disguised definite descriptions? Some theorists have argued that the kinds of structures that Elbourne appeals to in order to solve the problem of indistinguishable participants brings his semantics problematically close to its dynamic competitors (Dekker 2004, *forthcoming*, Schlenker 2011). Although I do not *directly* argue for dynamic theories, the arguments of §4.2-4.3 suggest that an adequate semantics for donkey anaphora will assign donkey anaphors denotations that are *anfully similar* to those of bound variable pronouns, while the mechanisms that explain their co-variation with their antecedents must be *anfully like* those that dynamic theories appeal to. Accordingly, some readers might take the view that these arguments, if successful, provide further support to the view that D-type theories *collapse into* or *reduce to* dynamic theories once they have undergone necessary revisions. The issue of whether D-type theories like Elbourne's collapse into dynamic theories is not straightforward, however. While it is not the aim of this chapter to settle this complex issue, I conclude in §4.4 with a brief discussion of some considerations that support the view that what is needed is a radically revised D-type theory rather than a dynamic account.

4.1 D-type theories of donkey anaphora

4.1.1 Cooper's relational analysis of donkey anaphora

In Chapters 2 and 3, I defended Cooper's (1979, 1983) semantics for pronouns, according to which pronouns contribute individual variables that may be bound or left free and evaluated in context. Cooper also addresses the problem of donkey anaphora, and argues that while donkey anaphors *also* contribute individual variables, their denotations are considerably more complex than those of ordinary referential and bound variable pronouns. According to Cooper, donkey anaphors correspond to *open definite descriptions*, composed of a definite article, a bindable individual variable, and an additional argument place for a contextually-supplied relation.

On the implementation of Cooper's proposal in Heim and Kratzer (1998, Ch. 11), the LF of a donkey anaphor consists of a definite article and a predicate made up of two variables. One of these is a free variable over functions of the relational type $\langle e, \langle e, t \rangle \rangle$ (the type of two place relations). The other is a bindable variable of type e (the type of individuals).

$$[\text{the } [R_{\langle 7, \langle e, \langle e, t \rangle \rangle} \text{ pro}_{\langle 1, e \rangle}]]^{83} \quad (\text{linear representation due to Elbourne 2005, 8})$$

The variable over relations, R , is assigned a salient relation in the utterance context, by an assignment function that includes a contextually determined mapping from variables to properties. For example, in (1) (repeated as (6) below), the salient relation assigned to R_7 is *donkey-owned-by*. The null pronominal element, 'pro', corresponds to Cooper's individual variable, which is bound in (6) by the λ -operator inserted below the subject.

(6) Every farmer who owns a donkey feeds it.

$$[\text{every farmer who owns a donkey}][\lambda_1 [t_1 \text{ feeds } [\text{the } [R_{\langle 7, \langle e, \langle e, t \rangle \rangle} \text{ pro}_{\langle 1, e \rangle}]]]]$$

$$[\text{the } [R_{\langle 7, \langle e, \langle e, t \rangle \rangle} \text{ pro}_{\langle 1, e \rangle}]] = \iota x. [\text{donkey}(x) \ \& \ \text{owned-by}(x)]$$

⁸³ Here the first component of the subscript is a numerical index and the second component of the subscript is a semantic type. For example, '7' in ' R_7 ', and '1' in ' pro_1 ', represent indices on variables, where e.g. ' $\langle 7, \langle e, \langle e, t \rangle \rangle$ ' indicates a function from a (here: contextually determined) variable assignment to a function of type $\langle e, \langle e, t \rangle \rangle$ (the type of two place relations). Following Elbourne (2005, 8), we can take the definite article to be of type $\langle \langle e, t \rangle, e \rangle$. (Heim and Kratzer do not specify its type, but Elbourne's is the natural choice.)

(where $g(R_7) = \lambda x. \lambda y. [donkey(x) \ \& \ owned-by(x)(y)]$)

The individual variable *pro* ranges over the values (the different farmers) in the quantifier's domain, and the open definite description *the donkey owned by x* designates the various donkeys owned by each farmer. On this analysis, (6) will be true just in case *every farmer who owns a donkey feeds the donkey he owns*.

4.1.2 Some problems for Cooper-style theories

There are a number of well-known problems with D-type theories like the one just sketched. One important problem is the so-called problem of the *formal link* (Heim 1982, Kadmon 1987, Heim 1990). Consider the pair in (7):

(7a) Every man who has a wife is sitting next to her.

(7b) ? Every married man is sitting next to her. (Heim 1982, 21-24)

The problem of the formal link is particularly pressing for D-type theories like Cooper's, where the descriptive content of the anaphor is contextually supplied. As Heim observes, the descriptive contents of donkey anaphors cannot be obtained just by picking up on any contextually salient relation – else, 'her' would be analyzable as 'the person x is married to' and (7b) would have the donkey reading available in (7a), where the sentence is true iff $\forall x (x \text{ is a man} \rightarrow x \text{ is sitting next to the wife/spouse of } x)$.

A second traditional problem for D-type analyses is the *uniqueness problem*. As pointed out by Heim (1982), D-type theories seem to predict that (8a) and (9a) respectively presuppose (or assert⁸⁴) *that if a farmer owns a donkey, he owns exactly one donkey and that everyone who has a dime has exactly one dime*.

(8a) If a farmer owns a donkey, he feeds it.

(8b) If a farmer owns a donkey, he feeds the donkey he owns.

(9a) Everyone who has a dime should put it in the meter.

⁸⁴On a Russellian view, sentences like (a) have the logical form in (b), where uniqueness and existence is *asserted* rather than presupposed.

(a) The *F* is *G*.

(b) $\exists x(F(x) \ \& \ \forall y(F(y) \rightarrow x=y) \ \& \ G(x))$

I will not have much to say about Russellian versus Fregean theories of definite descriptions here. For attempts to deal with the uniqueness problem in broadly Russellian frameworks, see Davies (1981) and Neale (1990a/b).

(9b) Everyone who has a dime should put the dime in the meter.

As Heim argues, (8a) and (9a) do not seem to carry the uniqueness implications that their paraphrases in (8b) and (9b) do (but see Kadmon 1987). The preferred reading of (8a) is that a farmer who owns at least one donkey feeds every donkey he owns – however many they are. Similarly, the preferred reading of (9a) is one on which the sentence is true just in case everyone who has at least one dime ought to put some dime in the meter.⁸⁵

Examples like (10) illustrate a particularly intractable version of the uniqueness problem for D-type theories, *the problem of indistinguishable participants*. The difficulty here is not so much neutralizing the unwelcome uniqueness implications associated with D-type anaphors, but finding appropriate D-type denotations for them that will enable each anaphor to pick out one of the pair of bishops uniquely.

(10) If a bishop meets a bishop, he blesses him.

We cannot interpret either pronoun as ‘the bishop’, since there is a pair of bishops at issue. At the same time, ‘the bishop who meets a bishop’ is also unsuitable, since meeting is a symmetric relation (if bishop *a* meets bishop *b*, then *b* meets *a* as well).

As we will see, the problem of indistinguishable participants initially seems to affect not only traditional theories like Cooper’s, but situation semantic D-type theories as well.

A third problem for D-type theories that will be of some importance in §4.4 involves an apparent contrast in the availability of de dicto/de re readings of pairs like (11a)/(11b):

(11a) Someone murdered Smith, but John does not believe that he murdered Smith.

(11b) Someone murdered Smith, but John does not believe that the man who murdered Smith murdered Smith

(11b) has both a reading on which it attributes to John a de re belief that the actual murderer of Smith (say, Jones) did not murder Smith *and* a reading on which John is said to irrationally believe

⁸⁵ Notice that whereas the preferred reading of (8a) is one on which every farmer is required to feed *every* donkey he owns (universal/strong reading), the preferred reading of (9a) is one on which every person is required to put *some* dime in the meter (the existential/weak reading).

that whoever murdered Smith (de dicto) did not murder Smith. According to Evans (1977a), however, (11a) has only the former, non-contradictory belief reading, where it attributes to John a belief that Jones murdered Smith – there is no counterpart of the de dicto reading of (11b). The puzzle for D-type theories is to explain why there is a contrast between (11a) and (11b) (and similar pairs involving other intensional operators).

Finally, Elbourne (2001a, 2005) argues that D-type theories – specifically, those (like Cooper’s) that invoke individual-variable binding – face an additional problem, involving VP-elliptical continuations of donkey sentences (‘the strict/sloppy identity problem’). As we will recall from Chapter 3, sentences like (12), in which an elided VP (‘did her homework’) contains a pronoun (‘her’) have two different readings (Ross 1967). On the *strict* reading, (12a), the sentence is true if Mary did Sarah’s homework. On the *sloppy* reading, (12b), the sentence is true if Mary did *her own* (Mary’s) homework.

Sarah did her homework...

(12) Mary did, too. (=Mary did her homework, too.)

(12a) Mary did Sarah’s homework. (*strict reading*)

(12b) Mary did Mary’s homework. (*sloppy reading*)

As we saw in Chapter 3, the traditional approach to strict/sloppy ambiguity is to derive the strict reading as a referential reading and the sloppy reading as a bound variable reading (Keenan 1971; Sag 1976; Williams 1977).

(12a’) Mary [λx_1 . did her₂ homework]

(12b’) Mary [λx_1 . did her₁ homework]

Since the classic account of sloppy VP ellipsis invokes variable binding, one might expect that sloppy readings will be available only if the elided pronoun is c-commanded by its antecedent. However, sloppy readings also seem to be possible for donkey anaphors (Hardt 1993, Fiengo and May 1994). For example, there is a sloppy donkey reading of (13) according to which every priest feeds *his own* (the priest’s) donkey.

(13) Every farmer who owns a donkey feeds it, and every priest who owns a donkey does, too.

(= Every priest who owns a donkey feeds it, too.)

One apparent virtue of Cooper's analysis is that it predicts this reading. On Cooper's view, the c-commanding subject can bind the individual variable contained by the Cooper-style description:

(14) Every priest_t who owns a donkey feeds *the donkey pro_t owns* too.

As Elbourne points out, however, Cooper's theory also *incorrectly* predicts sloppy readings of sentences like (15):

(15) Every farmer who owns a donkey feeds it and every priest does too. (= Every priest feeds it, too)

(15) can only mean that every priest feeds *some farmer's* donkey. However, since a Cooper-style analysis introduces a bindable variable into the reconstructed VP,

(16) Every priest_t feeds *the donkey pro_t owns* too.

...it incorrectly predicts a sloppy reading:

4.1.3 Elbourne's situation semantic D-type theory

According to Elbourne, Cooper's analysis over-predicts sloppy readings of elided donkey sentences because it relies on the wrong mechanism for generating co-varying readings. On Elbourne's view, the antecedents of donkey anaphors co-vary with their antecedents by quantification over *situations* rather than individuals (Berman 1987, Heim 1990, von Stechow 1994).

Elbourne's analysis is based on two main ideas, each of which involves a rejection of one of the two components of Cooper's analysis (the use of free relation variables, and the use of bindable individual variables). The first of these is that pronouns are underlyingly the same thing as definite articles (Postal 1966, Stockwell et al. 1973), which take deleted NP complements.⁸⁶ In Elbourne

⁸⁶ Postal (1966) notes that pronouns can combine with NPs to form what appear to be complex noun phrases e.g. 'we Americans' and 'us linguists'. Elbourne argues that these are not appositive constructions, since there is no 'comma intonation' characteristic of apposition. For example, (b) below is not a faithful translation of (a), since (b) implies a contrast between the troops addressed and some other troops.

(a) You troops will embark but those troops will remain.

(2005, 44), pronouns and ‘the’ receive the same analysis, differing only by feature presuppositions. For example, the entries for ‘the’ and ‘it’ are identical apart from the contribution that phi-features make to the latter’s interpretation (‘ $F(x)$ ’ in (18) means ‘ x is neuter and atomic’).

$$(17) \llbracket \text{the} \rrbracket = \lambda f: f \in D_{\langle e, t \rangle} \& \exists !x.f(x) = 1 . \iota x.f(x) = 1$$

$$(18) \llbracket \text{it} \rrbracket = \lambda f: f \in D_{\langle e, t \rangle} \& \exists !x.f(x) = 1 \& \forall x(f(x) = 1 \rightarrow F(x)). \iota x.f(x) = 1 \text{ (Elbourne 2005, 44)}$$

Of course, pronouns like ‘it’ do not (at least not *usually* – but see ft. 86) come with overt NP complements. However, many determiners permit deletion of a following NP under conditions of identity (so-called ‘NP deletion’) (Jackendoff 1968, Perlmutter 1970). Examples (19) and (20) illustrate the more general phenomenon of NP deletion, where the NP complements (‘advice’, ‘books’) of the quantifiers are deleted in the environment of identical NPs.

(19) When Sally wanted some advice, I gave her some. (= I gave her some advice.)

(20) Sam likes all children. John likes most. (= John likes most children.)

In the case of donkey anaphors, NP deletion is licensed by the occurrence of an identical NP associated with the donkey antecedent. For example, the complement of ‘it’ in (21) is the NP ‘donkey’.

(21) If a farmer owns a donkey, he feeds [*it* donkey].

Since the NP associated with the indefinite and the NP associated with the donkey anaphor are identical, the latter may be deleted.

A second important departure that Elbourne makes from Cooper’s account involves the mechanism of binding. According to Elbourne, donkey anaphors do not contain bindable individual variables. How, then, do the covarying readings of donkey sentences arise? Donkey sentences *do* involve binding, according to Elbourne – but not of individual variables. According to Elbourne, donkey anaphors co-vary with their antecedents via quantification over *situations*, in the sense of Kratzer (1989). On Kratzer’s semantics, situations correspond to parts of possible worlds, consisting

(b) You, troops, will embark, but those troops will remain. (Elbourne 2005, 52)
Postal proposes that pronouns that appear alone are followed by a phonologically null nominal like ‘one(s)’ (rather than a deleted NP), which is made explicit in dialectal forms like ‘we uns’ and ‘you uns’.

of individuals, properties of individuals, and relations between individuals, where individuals are conceived of as *thin particulars* (Armstrong 1978) – roughly, individuals considered in abstraction from the properties that they instantiate. The set of possible situations \mathcal{S} is ordered by the *part-of* relation, \leq , where a situation s is part of a situation s' iff s' contains all the individuals contained by s , instantiating the same properties and relations they instantiate in s . Propositions, in this semantics, correspond to sets of situations (rather than sets consisting of entire possible worlds). (The powerset of \mathcal{S} , $\wp(\mathcal{S})$, is the set of propositions.)

One notion that plays a crucial role in Elbourne’s semantics is the notion of a *minimal situation*. A situation s is a minimal situation verifying the proposition $p = \textit{that Mary owns a horse}$ iff p is true in s and s is a part of every situation s' in \mathcal{S} that verifies p (for every situation $s' \in \mathcal{S}$, if s' verifies p , $s \leq s'$). For example, suppose that p is the proposition *that Mary owns a horse*, and that p is true at the actual world w , where Mary owns both a horse and a donkey. Although a situation (e.g. a world-sized situation like w) in which Mary owns *both* a horse *and* a donkey is a verifier for p , no situation in which Mary owns both animals is a *minimal* situation verifying p , since a minimal situation verifying p will be a situation containing all and only those individuals, properties and relations that make p true (Mary, a horse, and the ownership relation holding appropriately between them). A situation s' containing Mary, a horse, *and* a donkey will be an *extension* of the minimal situation s verifying the proposition p – a situation containing all the individuals, properties and relations in s plus some additional features (here: a donkey).

Minimal situations are of importance for several reasons. According to Heim (1990), minimal situations provide a solution to the *uniqueness problem* considered above in §4.1.2. Consider (22) (i.e. Elbourne’s (17)/(18) revised to take into account dependence on situations):

$$(22) \llbracket \textit{the} \rrbracket^g = \llbracket \textit{it} \rrbracket^g = \lambda f \langle \langle s, e \rangle, \langle s, t \rangle \rangle. \lambda s: \exists! x f(\lambda s'. x)(s) = 1. \iota x f(\lambda s'. x)(s) = 1$$

(Elbourne 2005, 51)

According to (22), the pronoun ‘it’ (like the definite article) is associated with a semantic presupposition; the value of the pronoun is defined relative to an NP argument f only if f has unique

extension at each situation s . For example, if f is the function denoted by the NP ‘donkey’, then, relative to a situation s , ‘the donkey’ denotes the unique donkey in s , and is undefined if s contains no donkey or none that is unique.

How, then, do we avoid predicting that a sentence like (23) presupposes that every farmer owns some unique donkey? On the minimal situations account, the key to solving the uniqueness problem is to restrict the uniqueness presupposition to situations that are *minimal*. The basic idea is that in a sentence like (23a),

(23a) Every farmer who owns a donkey feeds it.

... the universal quantifier ‘every’ contains a set of minimal situations S in its restriction, where every situation s in S contains a unique farmer, a unique donkey, and the *ownership* relation holding appropriately between them. In order for (23a) to be true, each situation s must have a minimal extension s' in which the farmer in s feeds the donkey in s . A situation s' will be an extension of s (given what was earlier said) just in case s is a proper part of s' ($s < s'$). Now, while there are many situations s' which are extensions of s and contain several donkeys, none of these are *minimal* extensions of s . For s' to be a minimal extension of s (in which the farmer in s feeds the donkey in s), there must be no ‘smaller’ situation s'' (no situation $s'' < s'$) which is also a situation in which the farmer in s feeds the donkey in s . Consequently, s' is a minimal extension of s only if s' contains a unique donkey. However, since one and the same farmer can occur in different situations with different donkeys that he owns, there is no problematic implication that every farmer owns only one donkey. All that is implied or required is that every *minimal situation* in which a farmer owns a donkey be a situation in which the donkey owned is unique.

We have just seen that the uniqueness presupposition of (23a) is satisfied because the donkey in each base situation s in the restriction is unique and each situation s' in the set of extended situations that interpret the nuclear scope is minimal and thus contains exactly one donkey – the same as the donkey in s . However, for the same reason – because the unique donkey in s' that the farmer feeds is identical to the unique donkey in s that the farmer owns – (23a) is predicted to be true

just in case every farmer feeds the donkey he owns. In other words, the covarying reading of (23a) falls out of quantification over minimal situations – without appealing to bindable individual variables. This is the basic idea behind Elbourne’s approach to donkey anaphora and also that of Heim (1990). According to Elbourne, a sentence like (23a) will have the logical form in (23b) and the truth-conditions in (23c) (Elbourne 2005, 53):

(23b) [[every [man [who [λ_6 [[a donkey] [λ_2 [t_6 owns t_2]]]]]]]] [beats [it donkey]]]

(23c) λ_{s_4} . for every individual y :

for every minimal situation s_5 such that:

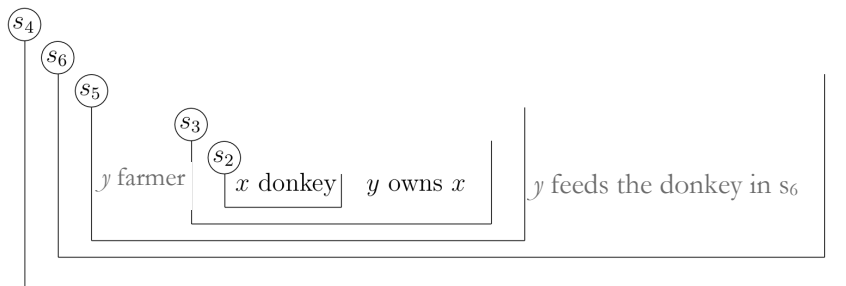
$s_5 \leq s_4$ and y is a farmer in s_5 and there is an individual x and a situation s_2 such that s_2 is a minimal situation such that $s_2 \leq s_5$ and x is a donkey in s_2 , such that there is a situation s_3 such that $s_3 \leq s_5$ and s_3 is a minimal situation such that $s_2 \leq s_3$ and y owns x in s_3 ,

there is a situation s_6 such that $s_6 \leq s_4$ and s_6 is a minimal situation such that $s_5 \leq s_6$ and y feeds in s_6 t_z z is a donkey in s_6 .⁸⁷

Observe that the predicates in the main clause and restrictor are relativized to different situation variables. This is a departure from the situation semantic D-type proposal in Heim (1990), where the predicates in the restrictor are all relativized to the same situation variable s , over a set of base situations, and those inside the nuclear scope (matrix clause) are relativized to a second variable s' , over a set of extended situations. (This departure from Heim, as we will see, plays an important role in Elbourne’s solution to the problem of indistinguishable participants.) The fundamental approach to the covarying reading, however, is the same. The covarying reading is obtained because the unique donkey which the farmer feeds in the larger situation s_6 (represented diagrammatically in (23d) below) is identical to the unique donkey introduced into the situation structure in s_2 by the indefinite ‘a donkey’ (which we learn, in s_5 , that the farmer owns).

⁸⁷ See Elbourne (2005, Appendix) for detailed derivation of these truth-conditions. See Elbourne (2005, 56-59) for a discussion of the relation between his approach and Heim’s.

(23d)



(Elbourne 2005, 53)

Since Elbourne does not capture the covariation between the donkeys owned and donkeys fed by associating donkey anaphors with bindable individual variables, his analysis provides a solution to the *strict/sloppy identity problem*. Recall that Cooper's proposal predicts a sloppy reading of the elided sentence in (24a), where the individual variable inserted into the replacement sentence in (24b) is bound (examples repeated below).

(24a) Every farmer who owns a donkey feeds it and every priest does, too. (= Every priest *feeds it*.) (strict/#sloppy)

(24b) Every farmer who owns a donkey feeds it and every priest feeds *the donkey he owns* too. (strict/sloppy)

By contrast, the replacement sentence in (24c), containing an Elbourne-style D-type description composed of the deleted NP 'donkey' has only the strict reading – like the initial sentence.

(24c) Every farmer who owns a donkey feeds it and every priest feeds *the donkey* too. (strict/#sloppy)

Why should this be? On Elbourne's approach, obtaining a sloppy reading for (24c) would require that the occurrence of 'every' in the sentence containing the ellipsis quantify over a set of situations containing a priest and a donkey he owns. However, since the restrictor does not contain an occurrence of the indefinite 'a donkey', the set of minimal situations characterized by the restrictor consists of situations that contain only priests. Consequently, the only donkeys for the anaphor in

(24c) to pick out are the ones contained in the set of situations characterized by the antecedent farmer sentence ('every farmer who owns a donkey feeds it'), and only the strict interpretation of (24a) is predicted. By contrast, (25a) is correctly predicted to have both strict and sloppy readings.

(25a) Every farmer who owns a donkey feeds it and every priest who owns a donkey does, too.

(=Every priest who owns a donkey feeds it too.)

(25b) Every farmer who owns a donkey feeds it and every priest who owns a donkey feeds the donkey, too.

The difference between the elided sentences in (24a) and (25a) is that the latter *is* associated with a donkey-introducing indefinite. Consequently, the definite description in (25b) can denote either the donkeys introduced by the first indefinite (belonging to farmers) or those introduced by the second indefinite (belonging to priests), generating the strict and sloppy readings, respectively.

4.1.4 The problem of indistinguishable participants

One important problem for D-type theories that also initially appears to affect Elbourne's analysis is the *problem of indistinguishable participants*, illustrated by (26) ((8), from above) (Heim 1990, 147–148, 157–158, citing Kamp):

(26) If a bishop meets a bishop he blesses him.

The question for D-type theories is how to interpret the pair of anaphors in the main clause. In a situation semantic D-type theory, the pair of bishops must be distinguished by either implicit NP material or situation variables associated with the anaphors; following Heim (1990), 'he' and 'him' are interpreted as functions $f_1(s)$ and $f_2(s)$, where f is a function mapping each argument to the situation variable s to one of the pair of bishops who meets a bishop in that situation. The problem raised by examples like (26) is that it is not clear what interpretation to assign to f to ensure that each of the pronouns picks out a unique bishop.⁸⁸ f_1 and f_2 cannot be the function which assigns to each s *the*

⁸⁸ By contrast, dynamic theories do not have difficulty accounting for the donkey readings of examples like (26), since each occurrence of 'a bishop' can introduce a separate variable into semantic representation,

unique bishop in s , since each situation s in the quantificational domain⁸⁹ contains a pair of bishops. At the same time, richer descriptive contents do not seem to help; $f_1(s)$ also cannot be the function that maps a situation s to *the unique bishop who meets a bishop* in s since meeting is a symmetric relation (thus if bishop a meets bishop b , then b meets a as well). Any situation (even one that is minimal) that is appropriately characterized by the antecedent of (26) contains a pair of – it would seem – *indistinguishable* participants, with identical descriptive properties. However, if the situation with respect to the pair of bishops is perfectly symmetrical – and, in particular, if there is no way to distinguish them on the basis of their descriptive properties – then there would also appear to be no way to forge the link between the values of the anaphors and the values of their antecedents in descriptive terms. Consequently, bishop sentences appear to pose a serious difficulty for D-type theories, since the leading idea behind these theories is that the link between the values of donkey anaphors and their antecedents is a descriptive one.

According to Elbourne, there *is* a way to descriptively characterize the values of bishop sentence anaphors – the situation with respect to the pair of bishops is *not* perfectly symmetrical. In contrast with (26), Elbourne observes, there is no donkey reading of (27):

(27) If a bishop and a bishop meet, he blesses him.

(As we will see, the contrast between (26) and (27) raises important difficulties for dynamic theories.)

According to Elbourne, (27) *does* treat the pair of bishops symmetrically – unlike (26). What, then, is the symmetry-breaking difference between the pair of bishops in (26)?

According to Elbourne, the key to the problem of indistinguishable participants is to recognize that the compositional semantics treats the pair of bishops in (26) differently. Elbourne assigns the antecedent of (26) (*if a bishop meets a bishop*) the logical form displayed in (28) (generated by quantifier raising).

(28) $[[a \text{ bishop}] [\lambda_6 [[a \text{ bishop}][\lambda_2 [t_6 \text{ meets } t_2]]]]]$ (Elbourne 2005, 146)

permitting each of the pronouns to depend on a different indefinite. For the same reason, however, they have difficulty predicting that (27) does *not* have a donkey reading. I return to this issue in §4.4.

⁸⁹Elbourne follows Heim (1990) and Berman (1987) in analyzing conditionals of the kind in (26) as implicit universal quantifiers over situations.

Meanwhile, the inclusion relations among the situations denoted by the antecedent, represented in (29), “mirror the inclusion relations among the syntactic constituents of the sentence” (2005, 147)

(29) $[s_1 [s_3 [s_2 x \text{ bishop}] [s_5 [s_4 y \text{ bishop}] x \text{ meets } y]]]$

The denotation of (28) is (30):

(30) $\lambda s_1 .$ there is an individual x and a situation s_2 such that s_2 is a minimal situation such that $s_2 \leq s_1$ and x is a bishop in s_2 , such that there is a situation s_3 such that $s_3 \leq s_1$ and s_3 is a minimal situation such that $s_2 \leq s_3$ and: there is an individual y and a situation s_4 , such that s_4 is a minimal situation such that $s_4 \leq s_3$ and y is a bishop in s_4 , such that there is a situation s_5 such that $s_5 \leq s_3$ and s_5 is a minimal situation such that $s_4 \leq s_5$ and x meets y in s_5 . (2005, 146-147)

In (30) above, we require that there be a situation s_5 within which two individuals x and y meet; this situation contains a smaller situation s_4 in which y is a bishop, and is contained within a larger situation, s_3 , which includes x 's bishophood. (Recall that situations contain thin particulars – individuals considered in abstraction from their properties – and thus can omit particular properties of individuals, like *bishophood*.) While the minimal situation s_5 contains both x and y (and the meeting relation holding between them), x 's bishophood is crucially *not* part of s_5 . Thus s_5 contains a unique bishop – it is a situation in which y is a bishop but x is not (the minimal situation s_2 in which x is a bishop is not a part of s_5).

The first part of Elbourne's solution, then, is distinguishing the pair of bishops on the basis of the way in which they are represented in the various situations that make up the complex situation structure characterized by the antecedent of the bishop sentence – in particular, on the basis that the bishophood of x is not a part of the situation s_5 .

The second part of Elbourne's solution consists in assigning the bishop sentence anaphors the right denotations to pick out the bishops distinguished by the first part of his solution. In order to derive the donkey reading of (26), the values of each anaphor must be descriptively linked to the values that one or the occurrence of the indefinite 'a bishop' contributes to the situation structure. According to Elbourne, the descriptive contents that forge this link are of a rather non-standard kind. Elbourne introduces the predicates 'distinguished' and 'non-distinguished', and stipulates their definitions as follows:

For any situation containing two particulars s_2 and s_5 , defined as above, call the bishop whose bishophood is not a constituent of s_5 the distinguished bishop. (2005, 149).

The *distinguished* bishop is the individual whose bishophood is not a constituent of the situation s_5 – the initial situation in which two thin particulars meet (one of whom is a bishop). The interpretation of the bishop sentence then proceeds by replacing one of the pair of anaphors in (26) by the definite description ‘the distinguished bishop’ (which refers the bishop whose bishophood is not a constituent of s_5), and the other by the definite description ‘the non-distinguished bishop’ (which refers to the bishop in s_5).

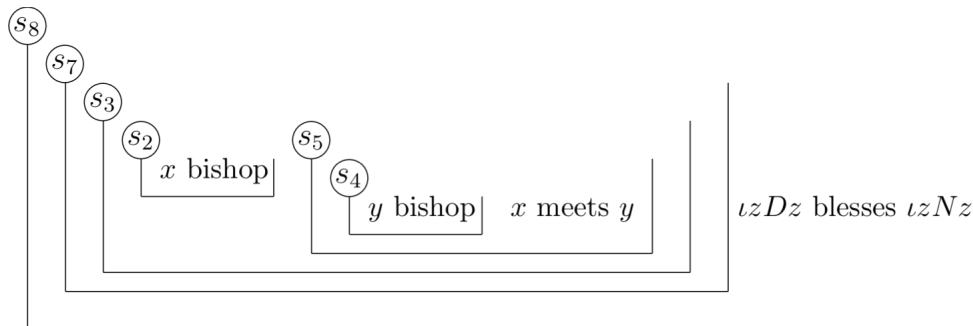
Elbourne leaves open how the additional content contributed by the predicates ‘distinguished’/ ‘non-distinguished’ (henceforth ‘D’ and ‘N’) enters into the semantics, though his comment below that “content accrues by whatever mechanism is used... in other cases of incomplete descriptions” suggests that the mechanism of enrichment is probably pragmatic in nature (in any case, these contents are seemingly not recovered from any morphologically realized item).

How does the content ‘distinguished’ or ‘nondistinguished’ enter the semantics? Here I do not need to commit to any particular theory, in fact. We can just imagine that the content accrues by whatever mechanism is used to supply content in other cases of incomplete definite descriptions. (2010, 70)

The bishop sentence then receives the truth-conditions in (31), visually represented by the structure in (32).

(31) λs_6 . for every minimal situation s_7 such that $s_7 \leq s_6$ and $[(30)](s_7) = 1$, there is a situation s_8 such that $s_8 \leq s_6$ and s_8 is a minimal situation such that $s_7 \leq s_8$ and the distinguished bishop in s_8 blesses in s_8 the non-distinguished bishop in s_8 . (2005, 149)

(32)



(ibid)

The truth-conditions of the bishop sentence require that the distinguished bishop bless the non-distinguished bishop and vary depending on which bishop occupies situation s_2 .

Elbourne’s solution to the problem of indistinguishable participants is complex, but ingenious – and the most thoroughgoing response to the problem that bishop sentences raise for D-type theories. At the same time, there are several worries it raises. For example, some commentators (Dekker 2004, *forthcoming*; Schlenker 2011) have asked whether the D-type theorist is entitled to the kinds of resources Elbourne uses to derive bishop sentence donkey readings – in particular, to situations that are fine-grained enough that a situations in which a bishop x meets a bishop y is different from a situation in which bishop y meets bishop x . Dekker (2004; *forthcoming*, Ch. 1) argues that situations as fine-grained as those that Elbourne appeals to may be isomorphic to quantificational cases.⁹⁰ Accordingly, Schlenker (2011, 348) suggests that the proposal confirms an old conjecture in Chierchia (1988) that that the problem of indistinguishable participants may require proponents of D-type theories to adopt quantification over entities: “more finely structured than what we have been assuming. Perhaps as fine grained as assignments to sequences of variables, which is of course the idea that DRT [Discourse Representation Theory] is built on” (Chierchia 1988, 72; see also Heim 1990). Schlenker observes that the situation theoretic analysis, when refined in the way

⁹⁰ Specifically, Dekker (2004) shows that situations are isomorphic to quantificational cases (n-tuples of variable assignments) given certain assumption, including that a situation in which *bishop B meets bishop B'* is different from a situation in which *situation B' meets bishop B*. Dekker argues this constraint, ‘distinctness’, is at odds with the theoretical motivation for the situation-based approach: “some form of non-distinctness has constituted one of the motivating reasons for the development of a situation-based account of adverbial quantification” (Dekker 1991, 14). What Dekker has in mind here is the role that distinctness plays in the situation semantic solution to the ‘proportion problem’ (which in turn provides one sort of motivation for adopting a situation semantics account). The proportion problem centers around the observation that the truth of a sentence like (a) only requires that every farmer who owns one or more donkey rides *one* of his donkeys to market – not that every farmer ride every one of his donkeys to market.

(a) If a farmer owns a donkey he rides it to market.

Kratzer’s (1989) solution to the proportion problem introduces the notion of one proposition ‘lumping’ another, where a proposition p lumps a proposition q in a world w iff (i) p is true in w , $w \in p$, and (ii) for all situations s in w , if $s \in p$, then $s \in q$. For example, the proposition *that farmer f rides donkey d_1 to market* and the proposition *that f rides donkey d_2 to market* lump the proposition *that f rides some donkey to market*, since every situation in which either of the former propositions is true is a situation in which the latter proposition is true. However, Dekker’s worry is that if situations do not individuate at a fine enough grain to distinguish a situation in which f rides d_1 to market from a situation in which f rides d_2 to market, then they will not individuate at a fine enough grain to distinguish a situation in which bishop B meets bishop B' from a situation in which bishop B' meets bishop B .

Although this is not the place to explore the issue, one option available to the situation semantics theorist who wishes to maintain distinctness yet capture the relevant reading of (a) is to allow that adverbs of quantification and conditionals (which are sometimes taken to involve covert adverbial quantification) can optionally quantify over equivalence classes of situations which may either lump situations or distinguish them depending on interpretative needs.

Elbourne proposes, “becomes quite close to a dynamic analysis”, “so close... that the difference may in the end be notational” (2011, 362)

Of course, *even if* Elbourne’s fine-grained situation structures correspond to quantificational cases, and the two kinds of theory utilize some of the same resources, this alone does not mean that Elbourne’s account ‘collapses into’ or ‘reduces to’ a dynamic theory in a sense that is problematic for his view. This question turns on a large and complex set of issues concerning the relation between dynamic and static theories that I do not have space to consider in this chapter. Accordingly, I will proceed on the supposition that the D-type theorist *is* entitled to the kinds of resources that Elbourne appeals to. However, the arguments of the following sections *indirectly* bear on the question of the relation between Elbourne’s theory and dynamic theories. In the section to follow, §4.2, I argue Elbourne’s solution to the problem of indistinguishable participants has important implications both for the other aspects of his theory (in particular, the NP-deletion component) and, more generally, for the way that static semantic theories account for the covariation between donkey anaphors and their antecedents. In particular, it shows that the descriptive resources D-type theories characteristically appeal to – antecedent recovered or contextually supplied descriptive contents – are inessential to capturing donkey anaphoric readings (and in certain cases, prove to be empirically problematic). Building on arguments in Leu (2005), I argue that the descriptive contents of donkey anaphors must be rather minimal contents, of a kind more characteristic of dynamic theories.

4.2 Taking the donkey out of the donkey anaphor: minimal descriptive contents

Elbourne advances the situation theoretic account of donkey anaphora in Heim (1990) in two important ways. Like Heim, Elbourne argues that donkey anaphors covary with their antecedents by quantification over situations rather than individuals. However, whereas Heim (1990) takes the denotation of predicates in the restrictors of donkey sentences to be assigned to one situation variable, Elbourne’s semantics has donkey sentences denote more complex situation structures, in which the denotations of predicates are relativized to different situation variables, which are then put

to work in resolving bishop sentence anaphora. Second, Elbourne proposes that donkey pronouns are definite determiners whose complements are deleted NPs. The NP deletion portion of Elbourne’s proposal is meant to in part to improve upon a solution that Heim proposes to the problem of the *formal link*. The problem of the formal link, as we saw in §4.1.2, concerns the contrast between pairs like (33) and (34).

(33) Every man who has a wife is sitting next to her.

(34) ? Every married man is sitting next to her. (Heim 1990, 165)

The unavailability of the donkey reading of (34) is surprising on Cooper-style proposals, where the descriptive contents of D-type pronouns are arguments to variables over salient relations. In particular, the contrast between (33) and (34) seems to show that the mere salience of a suitable relation (*spouse/wife of*) is not sufficient for donkey anaphora. According to Elbourne, in order to *keep* variables over salient relations, the proponents of these views must impose some constraint “to the effect that this variable can only take a value which is based, somehow, on the denotation of Noun Phrase in the context” (Elbourne 2005, 65). The question for D-type theories is why this should be so – why the values of relation variables are constrained in this way. As Elbourne observes, Chierchia (1992) is forced to add this constraint as a (somewhat unnatural) stipulation.⁹¹

In a configuration of the form NP_i ... it_i if it_i is interpreted as a function, the range of such functions is the (value of the) head of NP_i. (Chierchia 1992, 159; cited in Elbourne 2005, 65)

On accounts on which NP arguments are contextually supplied, it is not obvious *why* the relevant function must be identical to an NP in the immediate linguistic environment as opposed to one that is merely salient. Elbourne’s answer is that the constraint derives from the requirements on NP-deletion. For NP deletion to be licensed, there must be an identical NP in the immediate linguistic environment – in the case of donkey anaphora, one associated with the antecedent of the anaphor.

In the absence of any cue in the immediate physical environment, NP-deletion requires a linguistic antecedent, just like VP-ellipsis. (2005, 68)

Whereas this constraint is satisfied in the case of (33), there is no suitable linguistic antecedent in the

⁹¹ Chierchia (1992) employs a mixed approach to donkey anaphora that combines a modified dynamic proposal and D-type approach, where each strategy is meant to capture a distinct type of interpretation that donkey sentences exhibit (the existential/weak and universal/strong readings; cf. ft. 83).

form of an identical NP like ‘spouse’/‘wife’ in (34).

While the contrast in the availability of a suitable linguistic antecedent in the form of a deleted NP is sufficient to explain the corresponding contrast in the availability of the donkey readings of (33) and (34), the existence of some appropriate antecedent NP is not, in general, necessary or sufficient for donkey anaphoric readings to emerge. Bishop sentence cases (and, in particular, the contrast between symmetric and asymmetric bishop sentences) illustrate that the presence of a suitable antecedent NP is not *sufficient* for a donkey reading. On Elbourne’s view, the predicates ‘D’ and ‘N’, which are not provided by the antecedents of donkey anaphors (and do not seem to correspond to morphologically realized items at all), play a crucial role in licensing bishop sentence donkey anaphora. Since these predicates are not provided by the antecedents of donkey anaphors (and do not seem to correspond to morphologically realized items at all), the presence of a matching NP that licenses deletion is, at most, *necessary* for donkey anaphora. (More generally, extra descriptive material supplied by some (probably pragmatic) process is essential, on Elbourne’s view, given the existence of incomplete descriptions.)

Bishop sentences are not the only cases in which the complements of pronouns are not (or are not exhausted by) deleted NPs. According to Elbourne, *all* pronouns (not merely donkey anaphors) are definite articles. As Elbourne observes, the view that there is “NP-deletion every time a pronoun is used... might appear to run into difficulties with occasions where there is no NP in the preceding discourse that could serve as an antecedent” (2005, 123). Suppose, for example, that (35) is uttered in an out-of-the-blue context:

(35) Passing a man in the park: He looks happy!

We can easily imagine that there is no NP on the conversational record that provides an appropriate complement to the pronoun ‘he’ in (35). In cases like this, Elbourne allows pronouns to combine with a default item, the phonologically null NP ‘ONE’,⁹² which denotes the property of being an

⁹² In recent work (2010), Elbourne suggests that referential pronouns that lack linguistic antecedents can take a *contextually salient* NP complement. In (a), for example, the NP complement to ‘mine’ can be something like *dog* even if there is no prior mention of that NP.

element of the domain D_e of entities (Elbourne 2005, 124). Plugging Elbourne’s ‘ONE’ into the lexical entry for ‘he’ in (36), yields the definite description ‘the one’ in (37) (assuming all presuppositions are satisfied).

$$(36) [[\text{he}]] = \lambda f: f \in D_{\langle e, t \rangle} \ \& \ \exists! x: f(x) = 1 \ \& \ \forall y: f(y) = 1 \rightarrow fem(x). \ \iota x: f(x) = 1$$

$$(37) \iota x: x \in D_e$$

As Elbourne (2005, 124) observes, the question arises whether the NP ‘ONE’ might be invoked in other cases – even when there *is* an appropriate antecedent NP. For example, since the deleted NP ‘bishop’ does not play an essential role in establishing the values of bishop sentence anaphors – this task instead falling to the predicates ‘D’ and ‘N’ – the question arises whether ‘bishop’ can be replaced without loss with the null NP, ‘entity’. Let ‘the one_{emasc-atom}’ denote the partial function taking situations to individuals, which is defined relative to a situation s just in case there exists a unique *male, atomic entity* in s . The antecedent of the bishop sentence will have the denotation that Elbourne assigns it, (30) (repeated below as (37)), while the full sentence will have the denotation in (38):

(37) λs_1 . there is an individual x and a situation s_2 such that s_2 is a minimal situation such that $s_2 \leq s_1$ and x is a bishop in s_2 , such that there is a situation s_3 such that $s_3 \leq s_1$ and s_3 is a minimal situation such that $s_2 \leq s_3$ and: there is an individual y and a situation s_4 , such that s_4 is a minimal situation such that $s_4 \leq s_3$ and y is a bishop in s_4 , such that there is a situation s_5 such that $s_5 \leq s_3$ and s_5 is a minimal situation such that $s_4 \leq s_5$ and x meets y in s_5 . (2005, 146-147)

(38) λs_6 . for every minimal situation s_7 such that $s_7 \leq s_6$ and $[(37)](s_7) = 1$, there is a situation s_8 such that $s_8 \leq s_6$ and s_8 is a minimal situation such that $s_7 \leq s_8$ and the distinguished one_{emasc-atom} in s_8 blesses in s_8 the non-distinguished one_{emasc-atom} in s_8 .

The revised truth-conditions for the bishop sentence will require that the distinguished male atomic entity bless the non-distinguished atomic male entity, where ‘the distinguished F’ picks out, as before, the individual whose F_{ness} is not a constituent of the innermost situation s_5 . If we make the further, natural assumption that it is not merely the *bishophood* property of the distinguished participant that is omitted from s_5 but further properties, such as gender properties (which, in any case, seem to enter

(a) A host’s dog jump’s on a guest: “Mine does the same thing”
Elbourne (2005) opts instead for the view expressed above.

with the NP ‘bishop’),⁹³ then ‘the distinguished one_{masc-atom}’ and ‘the non-distinguished one_{masc-atom}’ will function as before, with each description picking out a unique bishop by reference to its location in the situation structure characterized by the antecedent of the bishop sentence.⁹⁴ Thus although it does no *harm* to invoke NP-deletion in bishop sentence cases, it is not doing any work for us either. The task of establishing the relation between the bishop sentence anaphors and their antecedents falls to the defined predicates ‘D’, and ‘N’.

In bishop sentence cases, there is no way to relate the values of donkey anaphors to the values of their antecedents solely on the basis of descriptive contents recovered from antecedent NPs. A natural view, then, is that the moral of the problem of indistinguishable participants is that antecedent-recovered NPs do not *in general* relate the values of donkey anaphors to the values of their antecedents. Abbott (2001, 4) suggests a more radical conclusion: that the problem of indistinguishable participants shows that there is “no way to distinguish either uniquely descriptive or functional content for the two intended referents”. Since descriptive contents cannot be used to relate donkey anaphors to their values of their antecedents, she argues, the only contents donkey anaphors have derive from their semantic features:

[D]onkey pronouns are pronouns and as such, it seems misguided to regard them as encoding any descriptive content other than features of person, gender and number. (ibid)

On Abbott’s view, bishop sentences are limit cases with more general consequences for the way in which donkey anaphora is accounted for, since whatever accounts for bishop sentence donkey anaphora will also presumably also account for donkey anaphora in the more general case.

This line of thought raises a worry for Elbourne’s NP-deletion proposal. Elbourne argues (*pace* Abbott) that there *is* a way to descriptively or functionally characterize the values of bishop sentence anaphors. However, since antecedent-derived descriptive contents like deleted NPs are *not*

⁹³ That is, there appears to be no reason why the information that the distinguished participant is male should be contained in the innermost situation s_5 , given that assumptions about the gender of the distinguished participant are only licensed when we get the information that the distinguished participant is a bishop.

⁹⁴ I am assuming that the property of *being an entity* (i.e. an object in the domain D_e of individuals) is *not* the sort of property that a thin particular can fail to have relative to a situation. Since both bishops will then have the property *being an entity* in s_5 , the property of the distinguished bishop that is omitted in s_5 will be the property *being male and atomic*.

responsible for bishop sentence donkey anaphora, the question arises whether antecedent-derived NPs must be invoked to account for donkey anaphora in the more general case – or whether the same kind of mechanisms used to derive bishop sentence donkey anaphora might replace NP deletion. It is, after all, rather odd to think that some special mechanism of co-valuation is at work in bishop sentence cases, and more natural to think, as Abbott seems to, that whatever establishes the relation between bishop sentence donkey anaphors and their antecedents also establishes the relation between ordinary donkey anaphors and their antecedents. If Elbourne’s account of the bishop sentence anaphora is on the right track, this line of thought proceeds, there is no further *need* to appeal to NP deletion.

While it does no *harm* to invoke NP-deletion in bishop sentence cases, Leu (2005) observes that there are actually several sorts of cases where the NP-deletion account runs into difficulties. Interestingly, the view that donkey anaphors combine with the null NP ‘ONE’ and the only ‘real’ descriptive contents they have are feature-based contents (and, in the some cases, the contextually supplied predicates ‘D’ and ‘N’) makes good predictions in these cases.

4.2.1 Sloppy VP ellipsis in Tomioka sequences

Leu observes that denotations like the one for ‘he’ in (38) provide a straightforward account of a difficult class of ellipsis cases, ‘Tomioka sequences’:

(40) Every farmer who owns a donkey feeds it, and every priest who owns a horse does too.

(= Every priest who owns a horse feeds it too.) Tomioka (1997, 193)

What is distinctive of examples like (40) is that they have sloppy readings (every priest who owns a horse feed his – the priest’s – horse) even though the indefinite antecedents of the elided and overt anaphors are different from one another. As we saw in §4.1.2, the classical view of VP ellipsis predicts that the ellipsis in (40) will be licensed just in case the antecedent and elided VPs have semantically identical contents. If this view is right, then the description corresponding to the donkey anaphor in the antecedent VP cannot be the description ‘the donkey’, since sentence in the elided

clause in (40) would then mean the same thing as (41),

(41) Every priest who owns a horse feeds the donkey too.

... and thus would be true iff either every priest feeds the donkey owned by the farmer (the strict reading) or every priest feeds the donkey that he (the priest who owns a horse) owns.⁹⁵ The sloppy reading of (40), according to which every priest who owns a horse feeds the *horse* he owns, is not predicted.

Elbourne's response to Tomioka cases is to reject the semantic identity requirement on VP-ellipsis, permitting the elided pronoun to recover its NP complement ('horse') from the second matrix subject.⁹⁶ As Leu points out, however, an alternative way to accommodate Tomioka cases that does not *depend* on adopting an alternative view (which Elbourne does not supply) of VP-ellipsis, is to associate both the antecedent and the elided donkey anaphor with Elbourne's null NP 'ONE'.

(42) Every farmer who owns a donkey feeds the $\text{one}_{\text{neuter-atom}}$, and every priest who owns a donkey feeds the $\text{one}_{\text{neut-atom}}$.

Since the elided and antecedent pronouns are taken to denote the same function from situations to individuals, the antecedent and elided VP are identical, and the VP can be straightforwardly copied into the ellipsis site. The truth-conditions (roughly characterized) for the elided sentence in (42) will require that every minimal situation s containing some unique farmer and a unique donkey he owns have a minimal extension s' where the farmer vaccinates the unique atomic, neuter entity in s' – the donkey that he owns. In contrast with Elbourne's proposal, this view does not *require* a departure from the traditional view on which full identity of antecedent and elided VPs is required for copying

⁹⁵ Elbourne suggests that the latter, sloppy reading is 'nonsense'. At a descriptive level, it seems to me that there *is* a way to make sense of the sloppy reading, by accommodating the presupposition that the priest owns a donkey. The considerations raised in §4.3 bear this out.

⁹⁶ Elbourne points out that there are uncontested cases involving NP-deletion strictly analogous to (40), such as (a) below, where the NP complement ('horses') of the elided quantifier phrase ('some horses') is recovered from the second matrix subject.

(a) Every farmer who owns some donkeys feeds some, and every priest who owns some horses does.
(= Every farmer who owns some donkeys feeds some donkeys, and every priest who owns some horses does feed some horses, too.)

Cases like (a) do indeed suggest that the full identity condition on VP ellipsis is too strong. I do not want to take issue with Elbourne's rejection of the semantic identity requirement on VP ellipsis per se. My aim is simply to show that there is a straightforward way to accommodate Tomioka cases that does not turn on its rejection.

(whether or not the full identity condition is to be rejected on other grounds).

In support of this proposal, note that while it is possible to construct Tomioka sequences by conjoining donkey sentences where the elided pronouns have agreeing features, if the pronoun copied from the antecedent VP does *not* agree with the matrix subject of the sentence containing the elided clause, the sloppy reading is marginal.

(43) Every farmer who sees a donkey feeds it,

(43a) #/?...and every farmer who sees John does, too. (=Every farmer who sees John feeds *him*.)

(43b) #/?...and every farmer who sees me does, too. (=Every farmer who sees me feeds *me*.)

(43c) #/?...and every farmer who sees his sister does, too. (=Every farmer who sees his sister feeds *her*.)

Some examples of this kind seem better than others:

(44) Every parent with a daughter took her to work today.

(44a) ?... and every parent with a son did too. (=Every parent with a son took *him* to work.)

(44b) ? ... and every parent of twins did too. (=Every parent of twins took *them* to work.)

(It is interesting to compare these facts with the VP ellipsis cases from Chapter 3. Even in (44), the sloppy readings seem harder to hear than the corresponding sloppy readings of ellipsis sentences involving bound pronouns that we considered in that chapter.)

One worry about Leu's strategy, of course, is that the impoverished descriptive contents assigned to donkey anaphors will make it difficult to satisfy the uniqueness presuppositions they trigger. Consider the following variant on the Tomioka case in (45):

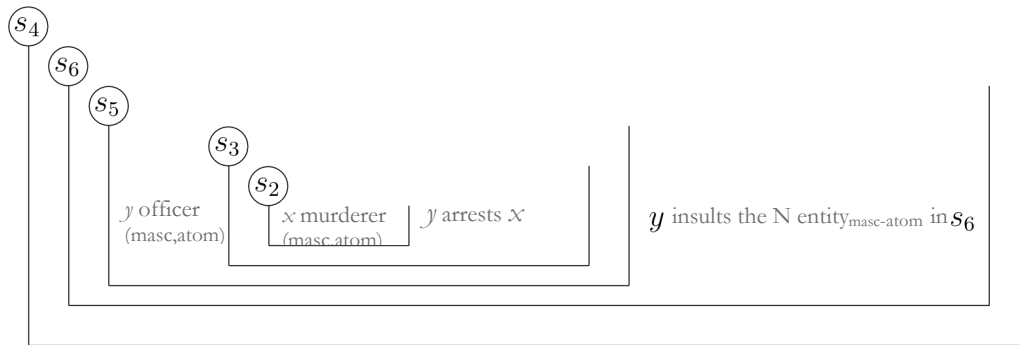
(45) Every police officer who arrested a burglar insulted him. Every police officer who arrested a murderer did, too. (= Every police officer who arrested a murderer insulted him.)

Suppose that some of the arresting officers and burglars they arrest are male. How are we to distinguish between the police officer who arrests the murderer/burglar and the murderer/burglar arrested by the policeman in terms of the features of the anaphor 'him'? The present analysis

represents the donkey anaphor ‘him’ as a function $f(s)$ from situations to individuals, where s ranges, in the first sentence, over minimal situations in which a police officer arrests a burglar, and in the second sentence, over minimal situations in which a police officer arrests a murderer. f cannot be the function which to each s assigns the *unique atomic male* in s , since each situation s in the domain of the universal quantifier contains *two* individuals with these properties.⁹⁷

Leu does not consider this problem, but the obvious solution is to appeal to Elbourne’s defined predicates, ‘distinguished’ and ‘non-distinguished’. The denotation of the sentence containing the ellipsis in (45) yields a complex situation structure, represented in (46) below.

(46)



Here, as in the case of the bishop sentence, there is a situation s_3 in which there is a pair of thin particulars, x and y , and where x arrests y . This situation is contained in a larger situation s_5 , where one of the thin particulars is an officer. In a parallel fashion, the individual whose masculinity and atomicity is not a part of s_2 (the officer) is the distinguished entity_{masc-atom}, while the individual whose masculinity and atomicity is a part of s_2 (the murderer) is the non-distinguished entity_{masc-atom}. The donkey anaphor ‘he’ corresponds to the definite description, ‘the N entity_{masc-atom}’, which denotes the non-distinguished entity in the larger situation s_6 (the murderer). The truth-conditions of the sentence containing the ellipsis then require that the officer insult the non-distinguished entity_{masc-atom}

⁹⁷ One worry here is that the NPs ‘D’ and ‘N’ might be assigned to the pronouns ‘he’ and ‘him’ in such a way as to produce the reading on which every police officer insulted himself. However, this assignment of values to the pronouns is blocked by Condition B, which prohibits a non-reflexive pronoun from taking a local (i.e. c-commanding) antecedent. In order for the pronoun ‘him’ to refer to the policeman introduced in the set of restrictor situations, it would have to take on the reflexive form ‘himself’, which marks the pronoun as co-referential with the subject of the verb. Thus the interpretation where ‘him’ is co-referential with the matrix subject might be ruled out by principles of syntax. (This strategy will not help with bishop sentences.)

(the murderer).

(47) $\lambda s_4 .$ for every individual y : for every minimal situation s_5 such that $s_5 \leq s_4$ and y is a police officer_{masc-atom} in s_5 and there is an individual x and a situation s_2 such that s_2 is a minimal situation such that $s_2 \leq s_5$ and x is a murderer_{masc-atom} in s_2 , such that there is a situation s_3 such that $s_3 \leq s_5$ and s_3 is a minimal situation such that $s_2 \leq s_3$ and y arrests x in s_3 , there is a situation s_6 such that $s_6 \leq s_4$ and s_6 is a minimal situation such that $s_5 \leq s_6$ and y insults in s_6 tz z is the non-distinguished entity_{masc-atom} in s_6

It thus seems that Elbourne's predicates 'D' and 'N' make it possible to derive the sloppy reading of donkey anaphors in Tomioka sequences while interpreting the donkey anaphors in the antecedent and elided VPs (and consequently the VPs themselves) in the same way.

4.2.2 Split-antecedent cases

Leu (2005) also observes that the naïve view of the contents of donkey anaphors makes good predictions in cases involving multiple or split-antecedent anaphora, where an anaphor is anaphorically related to more than one antecedent (Groenendijk and Stokhof 1991; Stone 1992; Chierchia 1995; Elbourne 2005, 84, citing Bernard Schwarz). For example, there is a natural donkey anaphoric reading of (48a) where the pronoun 'it' is anaphorically related to both indefinites, and the sentence is true just in case Mary waves to every horse and donkey she sees.

(48a) If Mary sees a donkey or a horse, she waves to it.

In Elbourne's semantics, the antecedent clause will denote a set S of minimal situations, where every $s \in S$ contains Mary, some unique animal in the form of a donkey or horse, and the *seeing* relation holding appropriately between them. In order to capture the split-antecedent reading of (48), each situation s must have a minimal extension s' in which Mary waves to the unique donkey or the unique horse (whichever one s contains) in s' .

The issue that (48a) raises for Elbourne's proposal is that there is no single antecedent DP that can provide the complement of the donkey anaphor 'it'. The NP cannot be either *donkey* or *horse* and must instead be something like *donkey or horse*. The difficulty is that this disjunction "is nowhere to be found. The nearest we have is *a donkey or a horse*, but this is not an NP but a disjunction of two DPs" (2005, 84). The solution Elbourne proposes to the split-antecedent problem involves the

“reconstruction of disjunctions and conjunctions of NPs from split-antecedents” (2005, 87). The entire disjunction ‘donkey or horse’ is to be interpreted as the NP complement of the pronoun *qua* determiner.

(48b) If Mary sees a donkey or a horse, she waves to *the donkey or horse*.

Adding in the situation variables that account for the covariation between the anaphor and its antecedents, we predict the following truth-conditions for (48a), analyzed as (48b):

For all s such that s is a minimal situation containing Mary, a donkey and the *seeing* relation holding appropriately between them, or s is a minimal situation containing Mary, a horse and the *seeing* relation holding appropriately between them, there is a situation s' which is a minimal extension of s in which Mary waves to the donkey or a horse in s' .⁹⁸

One difficulty for Elbourne’s proposal that it is not clear that the reconstructed sentence in (48a) is truth-conditionally equivalent to the original sentence, (48b). Intuitively, (48a) is true iff Mary waves to every donkey and every horse she sees. Surprisingly, (48b) has *weaker* truth-conditions than this, though the relevant judgments are subtle. In an informal poll, eight of ten native English speakers judged that (48a) is false and (48b) true in a situation where Mary sees horses and donkeys in pairs, but only waves to the horse member of the pair. To bring out the contrast more clearly, consider the following scenario:

Mary always sees horses and donkeys in pairs. Mary’s mother gives her only one apple for her lunch. Whenever Mary sees a horse-donkey pair, she waves to the horse member of the pair to come over for the apple. Because Mary only has one apple, and prefers horses, she does not wave to the donkey (knowing that she only has apples enough for one of them).

In this scenario, most speakers judged that the original donkey sentence (48a), along with the variant in (49a) below, is *false*, but that the replacement sentences, (48b) and (49b), are *true*. For the (a) sentences to be true, according to these informants, Mary must feed both every donkey *and* every horse she sees, while the (b) sentences require only that Mary wave to/feed her apple to one of the

⁹⁸One feature of Elbourne’s solution that is worth mentioning because it will be unattractive for many theorists (though I will not focus on this criticism here) is that the solution can only be extended to examples like (a) by assigning property-type denotations to proper names.

(a) If Mary sees John or Bill, she waves to him.

Recall that the pronoun requires an NP complement, since it is of the type of a definite article. Consequently, type e expressions cannot be arguments to anaphors. If, as Elbourne maintains, the anaphor is to be understood as a disjunction or conjunction of the proper names ‘John’ and ‘Bill’, then the names must be taken to be predicates: $[\lambda x.x=John]$ and $[\lambda x.x=Bill]$.

animals she sees.

(49a) If Mary sees a donkey or a horse, she gives it an apple.

(49b) If Mary sees a donkey or a horse, she gives the donkey or horse an apple.

Similarly, consider the contrast between (50a) and (50b). All of the speakers consulted judged that (50a) is true just in case Mary eats every doughnut or cupcake she is offered, but (50b) can be true so long as she eats at least one of them.

(50a) Whenever Mary is offered a doughnut or cupcake, she eats it.

(50b) Whenever Mary is offered a doughnut or cupcake, she eats the doughnut or cupcake.

(Notice that we can felicitously follow up (50b), but not (50a), with "... but not both".)

This apparent contrast in the truth-conditions of the (a)/(b) sentences in (48)-(50) generate two separate problems for Elbourne's proposal. The first, more local problem is that it suggests that split-antecedent anaphors are *not* equivalent to disjunctions or conjunctions of NPs. How, then, *are* they interpreted? One view is that they correspond to general descriptions like *the animal* or *the confectionary*.

(48c) If Mary sees a donkey or a horse, she gives *the animal* an apple.

(49c) If Mary sees a donkey or a horse, she waves to *the animal*.

(50c) Whenever Mary is offered a doughnut or cupcake, she eats *the confectionary*.

(48c)-(50c) seem to pattern with the split-antecedent donkey sentences in that they convey that Mary waves to/feeds every horse and every donkey she sees and that she eats every doughnut and every cupcake she is offered. At the same time, it is difficult to see how to recover NP complements like these ('animal', 'confectionary') if the NPs that split-antecedent anaphors combine with must be identical to NPs in the antecedent clause; presumably, these more general contents will have to be contextually supplied (another departure from the NP-deletion theory). Of course, it is not necessary to appeal even to descriptive contents as rich as these. A natural approach is again to invoke the default NP 'ONE', as Leu (2005) proposes, interpreting the split-antecedent anaphor 'it' in the examples above as *the entity_{neut-atomic}* (thus avoiding the need to appeal to (variable) contextually supplied

NPs).

$$[[it]]^g = \lambda s : \exists! x \text{ entity}(\lambda s'.x)(s) = 1 \ \& \ \forall x(\text{entity}(\lambda s'.x)(s) = 1 \rightarrow \text{neut-atom}(x)). \ \& \ \forall x \text{ entity}(\lambda s'.x)(s) = 1$$

On this proposal, the split-antecedent anaphor ‘it’ in (48a) denotes the function f mapping each situation s' to the unique neuter atomic individual in s' and the sentence is true just in case every minimal situation s containing Mary, a donkey and the *seeing* relation holding appropriately between them or Mary, a horse and the *seeing* relation holding appropriately between them, there is a situation s' which is a minimal extension of s in which Mary waves to the neuter atomic entity in s' .

In fact, the difference in the truth-conditions of the split antecedent (a) sentences and the (b) sentences containing Elbourne’s disjunctions hints at a second, more fundamental problem for Elbourne’s analysis. On the view that these examples involve quantification over *minimal* situations, it is puzzling that the (b) sentences should have true readings in the indicated scenarios. In order for a sentence like (49b) to be true in the situation where Mary does not feed any of the donkeys she sees, each situation s where Mary sees a donkey must be (or have an extension which is) a situation in which she also sees a horse – since (49b) is true in our scenario because Mary waves to the *horse* member of each pair. However, while the set of verifying situations tout court for the proposition *that Mary waves to the horse or donkey* include situations where Mary sees a pair consisting of a donkey and a horse, this should not be the case of any of its *minimal* verifying situations – which should contain either a donkey or a horse, but not both. I return to the question how this reading arises in section §4.3.

4.2.3 Strawson’s discourse anaphora

A third set of cases where the naïve view of the contents of donkey anaphors makes better predictions than more sophisticated accounts, including NP-deletion, involves discourses like (51), as discussed in Strawson (1952).

(51) a. Speaker A: A man fell over the bridge.

b. Speaker B: He did not fall. He jumped. (Strawson 1952, 187).

Strawson observes that the description that goes proxy for the anaphor in (51b) cannot be the description, ‘the man who fell over the bridge’ since (51b) would be a contradiction (‘the man who fell over the bridge did not fall’). One option here is to appeal to a disjunctive strategy of the kind that Elbourne applies to split-antecedent donkey anaphors, where the donkey anaphor ‘he’ is interpreted as ‘the man who fell or jumped’. Alternatively, Moltmann (2006, 208) suggests copying some proper part of the antecedent, to obtain a replacement description like ‘the man who *went* over the bridge’. Moltmann notes that this second strategy raises some worries about whether any systematic formal rule of copying can be given for identifying the replacement for the anaphor. A second problem for both Moltmann’s proposal and the disjunctive strategy is that they do not provide a fully general solution to the problem. The sequence in (51) can be continued:

(52) A man fell over the bridge... No, he jumped... Wait! He’s dangling from the edge....

Of course, appealing to some longer disjunction or more general description (‘the man who seemed to go over the bridge’) would not solve the problem, but push it back a step. The longer disjunction or still more general description may also be inadequate depending on how the subsequent discourse unfolds (imagine the series in (52) continued in whatever way you like). The fundamental problem is that the description chosen for a donkey anaphor must license subsequent anaphora even if speakers discover that the referent does not bear most (and if individuals are thin particulars, perhaps *all*) the descriptive properties it is initially taken to have. Since speakers are unable to anticipate the interpretative needs of subsequent anaphors (that is why the need arises for corrections like the ones in (52)), the anaphors must *originate* with minimal contents.

The naïve view does not have these difficulties. It predicts (correctly) that the only *unacceptable* continuations will be ones like (53a), where subsequent discourse challenges the descriptive characterization of the referent explicitly encoded in the phi-features (gender, number and person) of the anaphor.

(53) A person₁ jumped over the bridge. He must have been suicidal....

a. That wasn’t a man. But it’s true that #he must have been suicidal.

b. That wasn't a man. But it's true that she must have been suicidal.

The donkey anaphoric reading of the final continuation sentence in (53a) is blocked by the presuppositions associated with the features of the pronoun. Taking the pronoun 'he' to be anaphoric on the indefinite 'a person' would generate the false presupposition that that the person who jumped is female.

4.2.4 Symmetric bishop sentences

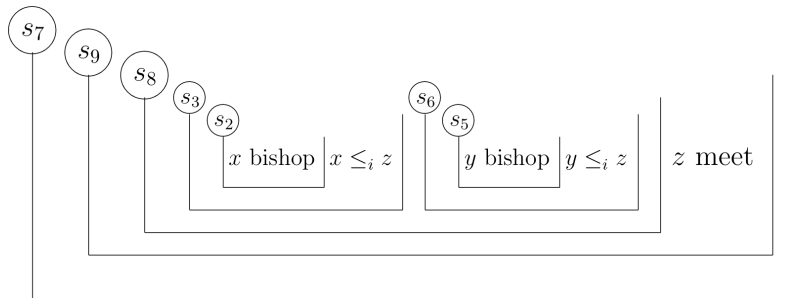
Finally, the view that donkey anaphors are associated only with feature-based contents and (optionally) the contents contributed by the predicates 'D' and 'N' makes good predictions for *symmetric* bishop sentences like (54b). (These cases will be discussed in greater detail in §4.4.)

(54a) If a bishop meets a bishop, he blesses him.

(54b) If a bishop and a bishop meet, he blesses him.

As we saw in §4.1.4, the compositional semantics for (54a) permits the pair of bishops to be distinguished on the grounds that the bishophood of one bishop y is part of the larger situation s_5 , while the bishophood of the other bishop x is not. In (54b), by contrast, the non-symmetric situation structure is not available. Regular, asymmetric bishop sentences like (54a) have donkey readings while symmetric bishop sentences like (54b) do not because there is *no distinguished bishop* in the situation structure characterized by the antecedent of (54b), represented in (55):

(55)



(Elbourne 2005, 156)

Since the predicates 'distinguished' and 'non-distinguished' are defined only for symmetric situation

structures, they cannot be used to (incorrectly) predict donkey readings for symmetric bishop sentence cases.⁹⁹

Elbourne's view also correctly predicts that donkey readings will *reemerge* in symmetric bishop sentences like (56), where the conjoined indefinites are associated with semantically distinct NPs.

(56) If a bishop and a nun meet, he blesses her.

Since the pair of indefinites in the antecedent are semantically distinct, the anaphors 'he' and 'her' can be assigned different semantic values.

As Barker and Shan (2008) point out, however, cases like (57) pose a *prima facie* difficulty for Elbourne's account of the contrast between the symmetric bishop sentences (54b) and (56):

(57) If a butcher and a baker meet, he pays him.

According to Barker and Shan, (57) does not have a donkey reading. As Elbourne (2009) points out, this claim is arguably too strong.

[(57)] is fine, of course, if we preface it with a declaration that butchers, or alternatively bakers, are particularly good at paying their debts to other tradesmen. (2009, 5)

A donkey reading *can* be recovered for (57) is a suitable context, e.g. where it is common ground that butchers (but not bakers) are good at paying their debts, or that tradesmen of one but not the other kind is usually in arrears. At the same time, it is not clear that this observation fully addresses Barker and Shan's objection. Since the pair of indefinites in (57) are semantically distinct, the anaphors 'he' and 'him' should be able to take semantically distinct deleted NP complements, as in (56), yielding a donkey reading of (57) even in an out-of-the-blue context, where there are no contextual clues as to whether it is the butcher who pays the baker or the baker who pays the butcher. As we will see in §4.4, this observation raises an important difficulty for the NP deletion theory. The point to notice for now, however, is simply that the naïve view straightforwardly predicts the infelicity of (57). Since there is no way to distinguish the pair of individuals in the situation structure characterized by the antecedent of (57) on the basis of their feature-related properties, and since this situation structure is symmetric (there is no distinguished individual), the donkey reading is not predicted. At the same

time, the donkey reading of (56) *is* predicted. Although the situation structure is symmetric, the anaphors ('he' and 'her') are associated with different semantic features. Consequently, it seems that the naïve view, on which NP deletion does *not* play a role in licensing donkey anaphora, provides a better account of the full complement of symmetric bishop sentences. I return to this point in §4.4.

4.2.5 Summary

Schlenker observes that Elbourne's theory is the one of the "most elegant and articulated... on the market" and it is plausible that proponents of D-type theories must in the end advert to a solution to the problem of indistinguishable participants like the one he proposes. The difficulty is that this solution undermines the motivation for the D-type theorist's claim that donkey anaphors are associated with descriptive contents of the kind familiar from D-type theories, supplied by variables over salient functions or deleted NPs. Once we have use of fine-grained situation structures and the predicates 'D' and 'N', there is no further need to associate donkey anaphors with deleted NPs. At the same time, the view that donkey anaphors *do not* have these richer descriptive contents makes better or more straightforward predictions in a variety of cases, including Tomioka sentences, split-antecedent anaphors, and for Strawson's discourse-based anaphora. These cases suggest that the moral of the problem of indistinguishable participants is that the relation between the values of donkey anaphors and their antecedents is not forged on the basis of antecedent-recovered descriptive contents, but instead by the non-standard descriptive contents Elbourne stipulates for the predicates 'D' and 'N' and by the considerably more standard feature-based contents of pronouns.

4.3 Donkey anaphors in intensional contexts (why Evans was right)

4.3.1 Split-antecedent anaphors revisited

In the previous section, I claimed that the case of split-antecedent anaphors highlights *two* problems for Elbourne's analysis. I argued that the truth-conditions of the split-antecedent sentences depart in subtle ways from the truth-conditions of the replacement sentences constructed by Elbourne's

preferred method of disjoining the antecedent NPs. For example, (58a) seems to be true just in case Mary eats every doughnut or cupcake she is offered, while (58b) requires that she eat at least one of them.

(58a) Whenever Mary is offered a doughnut or cupcake, she eats it.

(58b) Whenever Mary is offered a doughnut or cupcake, she eats the doughnut or cupcake.

The first, more immediate problem concerns the denotations Elbourne associates with split-antecedent anaphors. The contrast between (58a) and (58b) appears to show that split-antecedent anaphors are not semantically equivalent to disjunctions or conjunctions of deleted NPs. However, the contrast also hints at a second, more fundamental problem. On the view that the covarying readings of (58a) and (58b) involve quantification over *minimal* situations, it is puzzling that (58b) should even have a true reading in the case where Mary eats only one of the doughnut or cupcake she is offered. For example, in order for (58b) to be true despite the existence of a situation *s* where Mary declines a doughnut, it seems that *s* must be (or have an extension which is) a situation in which she eats a cupcake – since (58b) is true in because Mary eats one of the bakeries she is offered. However, while the set of verifying situations tout court for the proposition *that Mary is offered a doughnut or cupcake* include situations where Mary is offered a doughnut *and* a cupcake, this should not be the case of any of its *minimal* verifying situations – which should contain either a doughnut or a cupcake, but not both.

Must we give up the supposition that the verifying situations for (58b) are *minimal* situations? An alternative, more conservative explanation of the true reading of (58b) is that it is made available through accommodation of the presupposition the disjunctive description triggers, namely, *that there exists a unique doughnut or cupcake (in s)*. As Elbourne (2005, 59) observes, definite descriptions like ‘the woman’ in (60) come “dangerously close” in his semantics to making the same contribution as indefinite descriptions like ‘a woman’ in (59).

(59) Every man loves a woman.

(60) Every man loves the woman. (Elbourne 2005, 60)

According to Elbourne, (59) is true just in case for every minimal man-containing situations s' , there is some minimal extension s'' of s' which there is a woman and the man in s'' loves the woman in s'' . By contrast, (60) will be true just in case for every minimal man-containing situations s' , there is some minimal extension s'' of s' which the man in s'' loves the unique woman in s'' . The “discomfiting possibility”, Elbourne observes,

... is that sense can be made of this as follows. We take each of the minimal man-containing situations s' and look for some way of extending it to a situation containing a woman and the information that the man of s loves the woman, and nothing else. Then there will indeed be such extensions s'' of each s' . (2005, 60)

The difference between the sentences is that the existential implication of (60) is a *presupposition*:

[In (60)] it is *presupposed* rather than asserted that each situation s' contains exactly one woman. Thus it is necessary that this presupposition be accommodated. (ibid)

Assuming that the presupposition that there exists a unique woman for every assignment of man can be accommodated, however, both the indefinite and (accommodated) definite description *introduce a new entity* (some particular woman) into each situation s' . Bearing this in mind, consider again our example (58b) from above:

(58b) Whenever Mary is offered a doughnut or cupcake, she eats the doughnut or cupcake.

The consequent clause denotes the property: $\lambda s \lambda x[x \text{ eats the doughnut or cupcake in } s]$. Suppose that we allow the descriptive operator to distribute over the disjunction, yielding the disjunction: $\lambda s \lambda x[x \text{ eats the doughnut in } s \text{ or } x \text{ eats the cupcake in } s]$. According to Karttunen and Peters' (1979) rule of presupposition projection for disjunctions:

If A has content p and presupposition p' , and B has content q and presupposition q' , then the presupposition of A or B is the proposition $(q \vee p') \ \& \ (p \vee q')$.

Our first disjunct has the presupposition $p' = \text{that there exists a unique doughnut in } s$, and the content $p = \text{that } x \text{ eats the doughnut in } s$. Our second disjunct has the presupposition $q' = \text{that there exists a unique cupcake in } s$, and the content $q = \text{that } x \text{ eats the cupcake in } s$. Applying the Karttunen and Peters rule, we predict that the consequent clause $(\lambda s \lambda x[x \text{ eat the doughnut in } s \text{ or } x \text{ eats the cupcake in } s])$ presupposes the following conjunction of disjunctions of propositions:

$(x \text{ eats the cupcake in } s \text{ or there exists a unique doughnut in } s) \ \& \ (x \text{ eats the doughnut in } s \text{ or}$

there is a unique cupcake in s)

Consider a situation s in which Mary is offered a doughnut and let s be minimal, so that s contains Mary and some unique doughnut – but no cupcake. The first conjunct of the conjunctive presupposition triggered by the disjunction of descriptions is true, since there exists a unique doughnut in s – the one introduced into s by the indefinite ‘a doughnut’. However, the second conjunct (itself a disjunction), we may suppose to be false, since Mary does not eat the doughnut in s . The second disjunct is also false: since there is no unique cupcake in s (the situations in the denotation of the consequent clause are minimal, and contain only Mary and the unique doughnut she is offered), there is no cupcake for Mary to eat. As a consequence, the entire conjunction is false and the sentence will be a presupposition failure – unless something is *accommodated*.

What might we accommodate? The most obvious accommodation strategy is to accommodate the presupposition *that there exists a unique cupcake*, thereby introducing a new entity (a unique cupcake) into each of the extended situations s' in the denotation of the consequent, and making the second conjunct true by making one of its disjuncts (*there is a unique cupcake in s*) true. Since Mary eats *one* of the bakeries she is offered, if she declines the doughnut, she will eat the cupcake. Consequently, the first conjunct is also true since one of its disjuncts (*that Mary eats the cupcake*) is true. Moreover, since both the first and second conjuncts are true, the conjunctive presupposition as a whole is true, and we predict that (58b) can be true if Mary eats at least one of the bakeries she is offered – as desired.¹⁰⁰

One worry about this explanation of the true reading of (58b) is that it relies on the assumption that it is possible to accommodate the definiteness presupposition triggered by the definite description ‘the doughnut or cupcake’ e.g. by introducing a unique cupcake into doughnut-declining situations. However, according to Elbourne (2005, 61-62; see also Beaver 1997 and von Stechow 2008), ‘minimal’ definite descriptions like ‘the doughnut’ and ‘the cupcake’ *resist accommodation*.

¹⁰⁰ A different response is to maintain that the split-antecedent anaphor ‘it’ is interpreted as the description ‘the doughnut or cupcake’ where the definiteness operator takes *narrow scope* (does not distribute) over the disjunction. The difficulty with this approach, however, is that the definite description ‘the doughnut or cupcake’ will then be ambiguous in a way that the donkey anaphor ‘it’ is not, and consequently the two cannot be equivalent.

This is Elbourne’s basis for resisting the objection that his semantics predicts that a quantificational reading analogous to that of (59) can be recovered from the truth-conditions he assigns to sentences like (60) (repeated from above).

(59) Every man loves a woman.

(60) Every man loves the woman.

The “grounds for rejecting this objection”, Elbourne claims, are that the definiteness presupposition associated with (60) (*that there exists a unique woman for every man*), even if true, is not “automatically accommodated”.

Now it might seem that there will be no difficulty in making the accommodation: the truth conditions only claim, after all, that for each minimal man-containing situation *s*’ there is an extended situation *s*” that contains exactly one woman; and this is obviously true, whatever set of men we take to be used in the restrictor. ... However, it is not the case that all presuppositions which are obviously true are automatically accommodated... (2005, 61)

In particular, Elbourne argues, the definiteness presuppositions associated with *minimal* descriptions like ‘the woman’ in (60) and ‘the donkey’ in (61) (in contrast with Cooper-style descriptions) are difficult or impossible to accommodate in out-of-the-blue contexts. For example, the presuppositions triggered by ‘the donkey’ in (61) cannot be accommodated if no (unique) donkey is salient.

(61) ? The donkey likes carrots.

Elbourne links this observation to the more general problem that arises with accommodation of presuppositions with an anaphoric or contextual meaning (Beaver 1997; von Stechow 2008; Kripke 2009). For example, the presupposition triggered by the anaphoric expression ‘too’ in (62) – roughly, *that someone other than Mary is having dinner in New York* – cannot be accommodated unless an alternative to the proposition *that Mary is having dinner in New York* is salient (e.g. *that your mother in law/Axl Rose/Nelson Mandela is having dinner in New York*, etc).

(62) Mary is having dinner in New York too.

All that this implies for our proposal concerning split-antecedent cases, however, is that the truth-conditions of pairs like those in (49) and (58) (repeated below) will only come apart in certain

contexts – not out-of-the-blue contexts, perhaps, but contexts like the one used to set up (49), where it is common ground that Mary sees donkeys and horses in pairs.

(49a) Whenever Mary sees a horse or a donkey, she feeds it an apple.

(49b) Whenever Mary sees a horse or a donkey, she feeds the horse or donkey an apple.

(58a) Whenever Mary is offered a doughnut or cupcake, she eats it.

(58b) Whenever Mary is offered a doughnut or cupcake, she eats the doughnut or cupcake.

This prediction seems to be right; in order to hear the difference in the truth-conditions of the sentences in (49),¹⁰¹ it *is* necessary to construct a situation e.g. where there is a salient relation between Mary’s seeing a donkey and feeding a horse. However, the point is that the truth-conditions of the sentences do come apart. As long as the context is constructed so that accommodation is possible, the replacement sentence is ambiguous in a way that the original sentence is not.

The intuitions involved in split-antecedent cases are somewhat delicate and I do not want to rest *too* much weight on them. What I wish to suggest, however, is that the subtle differences in the truth-value judgments that pairs like these elicit are the product of more general differences in the narrow scope-taking (or local accommodation potential) of donkey anaphors and definite descriptions that underlie Evans’ (1977a) observations from §4.1.2 concerning the availability of de dicto/de re readings of sentences containing donkey anaphors.

4.3.2 Donkey anaphors in intensional contexts

Although Evans (1977a, 1977b, 1980) is a standard reference for D-type theories, he in fact insists that donkey anaphors are *not* equivalent to definite descriptions. Evans argues that donkey anaphors are instead rigid referring expressions, on the grounds that they do not admit of narrow scope or de dicto readings. As a consequence, Evans maintains, sentences that result from substituting donkey anaphors with definite descriptions, which *do* admit of narrow scope readings, are “often ambiguous in a way in which the original sentence is not” (1977a, 518). For example, (62b) has both has a de re

¹⁰¹ I am not as sure that it is necessary to construct special contexts in order to hear a truth-conditional difference between the sentences in (58).

reading and a prominent de dicto reading:

(62a) A man murdered Smith, but John does not believe that *he* murdered Smith.

(62b) A man murdered Smith, but John does not believe that *the man who murdered Smith* murdered Smith.

On the de re reading, in (63) below, the description is given widest scope and the sentence is true just in case John believes of whichever man murdered Smith – Jones, for example – that he did not murder Smith. On the de dicto reading, (64), the description is given narrow scope and the sentence is true just in case John irrationally believes that the man who murdered Smith did not murder Smith.

(63) [the x : man x & x murdered Smith] John does not believe that (x murdered Smith)

(64) John does not believe that ([the x : man x & x murdered Smith](x murdered Smith))

According to Evans' judgments, (62a), which contains a donkey anaphor in the place of the definite description, has only the de re reading, where John is said to believe, of some particular man who (unbeknownst to John) in fact murdered Smith, that he did not murder Smith. There is no counterpart of the de dicto reading represented by (64), where (62a) attributes a contradictory belief to John.

Evans observes a similar difference in the scope-taking behavior of definite descriptions and donkey anaphors in relation to modal verbs. According to Evans, (65a) is “unambiguous, with just the referentially rigid reading, while its prolix version [(65b)] is ambiguous” (1977a, 519).

(65a) John owns a donkey who likes carrots. But *it* might not have liked carrots.

(65b) John owns a donkey and it likes carrots, though it might not have been the case that *the donkey John owns* likes carrots.

By the ‘referentially rigid reading’, we should understand Evans to mean a de re reading on which (65a) is true just in case there is some world w' accessible from the actual world w and the donkey John owns at the actual world w does not like carrots at w' . According to Evans, (65a) has *only* the de re reading, whereas (65b) has a de re reading *and* a de dicto reading. On the latter, (65b) is true, roughly, iff some donkey that John owns at a world w' accessible from the actual world w does not

like carrots at *w*'.

The contrast between pairs like those in (62) and (65) arises, according to Evans, because definite descriptions interact scopally with operators in ways that donkey anaphors do not; whereas “descriptions give rise to scope ambiguities when interacting with almost all operators”, donkey anaphors resolutely take wide scope or are ‘scopeless’ (1977a, 518). The reason for this, according to Evans, is that donkey anaphors are *not* semantically equivalent to definite descriptions and instead have their references *fixed* by description (in the sense of Kripke 1972), “refer[ing] to those objects which verify (or that object which verifies) the sentence containing the antecedent” of the anaphor (1980, 111).¹⁰² For example, if the object that verifies the sentence “Someone murdered Smith” is Jones, the donkey anaphor ‘he’ in (62a) *refers* to Jones (its reference fixed by a description like ‘whoever murdered Smith’), and (62a) attributes to John a (non-contradictory) singular belief *that Jones did not murder Smith*.¹⁰³

One difficulty with Evans’ criticism of D-type theories is that the empirical claim *that donkey anaphors take obligatory wide-scope* is far too strong (Davies 1981, Neale 1990a). Davies (1981, 172-173) observes that the de dicto reading of the clause containing the anaphor in examples like (66) and (67) is available, if not preferred. For example, (66), which is of the same general form as (62a), has a clear de dicto reading, according to Davies, where the sentence is true even though the police do not have

¹⁰² Evans extends this view to donkey anaphors with quantificational antecedents by adopting a substitutional account of the associated quantifiers.

¹⁰³ While Evans (1977a, 132) describes donkey anaphors as being equivalent to “modally rigid expressions”, Soames (1989b, 145-147) and Neale (1990b, 130-131) point out that he is better construed as making the (weaker) claim that donkey anaphors are equivalent to wide-scope descriptions. As Kripke (1980) points out, being rigid and taking obligatory wide-scope do not amount to the same thing: a sentence containing a wide scope description will be satisfied by different individuals at different circumstances of evaluation, while a rigid designator refers to the same individual at every circumstance. Soames and Neale both observe that donkey anaphors cannot be rigid designators since, at different circumstances of evaluation, the clauses containing their antecedents will be verified by different objects (at least in those cases where the antecedent is not a rigid designator). Since the requirement on donkey anaphors is that they take on the same value or range of values as their antecedents, the anaphor will refer to different objects at different circumstances. For example, ‘them’ in (a) cannot rigidly refer to whichever donkeys John actually bought, e.g. d_1 and d_2 , for, if so, the sentence below would be true at any circumstance where John bought some (possibly distinct) donkeys d_3 and d_4 and Harry vaccinated d_1 and d_2 .

(a) John bought some donkeys and Harry vaccinated them.

Intuitively, (a) is true at a circumstance w just in case Harry vaccinates at w whichever donkeys John bought at w . This reading is obtained only if ‘them’ picks out different donkeys at different circumstances.

a particular man in mind as the murderer of Smith.

(66) A man murdered Smith. The police have reason to think he injured himself in the process. Likewise, (67) seems to have a clear reading reporting a de dicto belief that whichever witch killed Trigger also blighted Matilda (her symptoms are the same as those displayed by Trigger).

(67) Hob thinks that a witch killed Trigger. He also suspects that she blighted Matilda. Even in the case of Evans' original examples, it is not clear that the sentences must be read de dicto. According to Neale (1990b, 131), the de dicto reading of the anaphor clause in (62a) is "technically available, but equally unlikely" (but for a contrasting view, see Elbourne (2005, 5)).

(62a) A man murdered Smith, but John does not believe that he murdered Smith.

(65a) John owns a donkey who likes carrots. But it might not have liked carrots.

At the very least, however, it seems clear that there is a contrast in the *availability* of the de dicto readings of (62a) and the corresponding 'prolix sentences' that needs to be explained. That is, even if Davies and Neale are right that the de dicto readings of the anaphor clauses in (62a) and (65a) are possible, these readings are considerably harder to obtain than the corresponding de dicto readings of (62b) and (65b).

According to Elbourne, the solution to Evans' puzzle "lies in distinguishing between different definite descriptions that could be interpretation of the pronoun" (2005, 7). The contrast between pairs like those in (62) and (65) reveals a problem with *the choice* of definite description ('the donkey he owns') rather than a problem with the view that the donkey anaphor is equivalent to some definite description or other. In particular, what is required is "a theory that will restrict the descriptive content of the pronoun of this kind to being rather minimal" (ibid). Elbourne's own D-type theory does this. For example, the replacement description for the donkey anaphor in (65a) will be a description like 'the donkey', comprised of some proper part of the descriptive material in the antecedent, (65c). ((65a)/(65b) repeated from above.)

(65a) John owns a donkey who likes carrots. But it might not have liked carrots.

(65b) John owns a donkey and it likes carrots, though it might not have been the case that *the*

donkey John owns likes carrots.

(65c) John owns a donkey which likes carrots, though it might not have been the case that *the donkey* likes carrots.

Elbourne argues that his own D-type theory correctly predicts that de dicto readings of donkey anaphors will be marginal, given the descriptive contents assigned to the anaphors – and that in this respect his proposal is superior to a Cooper-style account, which predicts that the content of the donkey anaphor will be a description like ‘the donkey he owns’. The de dicto reading of (65c), where the pronoun ‘it’ is replaced by ‘the donkey’ (*vs* ‘the donkey John owns’) is marginal – like the de dicto reading of the original sentence, (65a).

Likewise, the de dicto reading of (62c), where the pronoun ‘he’ has been replaced with ‘the man’ is hard to recover in contrast with the de dicto reading of (62b), where the anaphor is replaced with the complex description ‘the man who murdered Smith’. ((62a)/(62b) repeated from above.)

(62a) A man murdered Smith, but John does not believe that he murdered Smith.

(62b) A man murdered Smith, but John does not believe that *the man who murdered Smith* murdered Smith.

(62c) A man murdered Smith, but John does not believe that *the man* murdered Smith.

(Elbourne actually claims something stronger than this – that (62a) “has no reading on which it attributes to John a contradictory belief; John is simply said to believe of the murderer that he is not the murderer” (2005, 5).)

Elbourne’s minimal definite descriptions, ‘the man’ and ‘the donkey’, *do* seem to exhibit scope-taking behavior more similar to that of donkey pronouns. However, Evans’ problem is not yet solved. There is *still* an important scope-related difference to be explained.

One way to test for the availability of wide and narrow scope readings of definite descriptions is to consider what kinds of anaphora they support. Consider (68a), and suppose that the minimal description that replaces the anaphor ‘he’ is ‘the person’.

(68a) Someone murdered Smith. John believes that he is insane.

(68b) Someone murdered Smith. John believes that the person is insane.

Suppose, furthermore, that *a man*, Albert, murdered Smith, but John mistakenly believes that the murderer is some woman or other. Consider the anaphoric continuations of the replacement sentence (68b), in (69a)-(69b) below, where the donkey pronouns ('he' in (69a) and 'she' in (69b)) are anaphoric on the D-type definite description, 'the person'.

Someone murdered Smith...

(69a) John believes that the person₁ is insane... and that *he*₁ will strike again. (de re only)

(69b) John believes that the person₁ is insane... and that *she*₁ will strike again. (de dicto only)

Both (69a) and (69b) are acceptable reports of what John believes. The donkey anaphoric reading of the sequence in (69a) is a *de re* reading, where the donkey anaphor 'he' refers to the actual satisfier of the antecedent definite description, Albert, and the anaphor clause presupposes (truly) that Albert is male. (69a) does *not* have an acceptable *de dicto* anaphoric reading, however. On the *de dicto* reading, 'the person' would take narrow scope and range over the various individuals who murdered Smith in the set S of situations compatible with John's beliefs. Since John believes that the murderer of Smith is a woman, in every situation $s \in S$, the value of 'the person' is a female individual. Consequently, on the *de dicto* reading, the sequence in (69a) is a presupposition failure, since it requires that the anaphor ('he') range over the various persons denoted by the description, 'the person' at the situations compatible with what John believes, all of whom are female.¹⁰⁴

The situation in the case of (69b) is precisely the reverse of this. The only acceptable donkey reading of the sequence in (69b), where the pronoun 'she' is anaphoric on the antecedent definite description is the *de dicto* reading, where the definite description takes narrow scope and ranges over the various females who murdered Smith in all the situations compatible with John's beliefs. On the *de re* reading, where the donkey anaphor 'she' refers to the actual satisfier of the antecedent definite description, Albert, the anaphor clause presupposes *falsely* that Albert is female.

What (69a) and (69b) show is that proxy sentences like (68b) containing Elbourne-style

¹⁰⁴An anaphor like 'he' might be appropriate (on a gender-neutral use) if it is compatible with what John believes that the murderer is male – but not if John believes that the murderer is female.

minimal D-type descriptions have both de re and de dicto readings, supporting both de re anaphors like ‘he’ (when the description takes wide scope), and de dicto anaphors like ‘she’ (when it takes narrow scope). Of course, Elbourne does not deny that de dicto readings of minimal descriptions are *possible* – simply that they are more marginal than the de dicto readings of sentences like (68c), containing Cooper-style descriptions. ((68a) and (68b) repeated from above.)

(68a) Someone murdered Smith. John believes that *he* is insane.

(68b) Someone murdered Smith. John believes that *the person* is insane.

(68c) Someone murdered Smith. John does not believe that *the person who murdered Smith* is insane.

Elbourne is surely right about this. The difficulty, however, is that the narrow scope reading of the corresponding donkey sentence, (68a), is not simply marginal. The following puzzle helps elicit the problem with the view that (68a) has a de dicto reading. Consider (68d), where the anaphor ‘he’ in (68a) is replaced with a feminine pronoun:

(68d) Someone murdered Smith. John believes that *#she* is insane.

The puzzling fact is that there is *no* donkey anaphoric reading of (68d). On the one hand, given that the actual murderer of Smith (Albert) is male, the absence of a *de re* donkey reading is expected. What is surprising here is that there is *no de dicto* reading either – no reading where the anaphor ranges over the various (female) persons who might have murdered Smith, for all John believes, in the way that the narrow scope description in (68b) does (and must, in order to support the de dicto anaphor in (69b)). Why can’t we recover a donkey reading for (68d), if the donkey anaphor is equivalent to the definite description ‘the person’?

There is no great mystery why the de dicto anaphoric reading of (69d) is unavailable. As Soames (1989b) observes (commenting on Evans’ proposal that donkey anaphors are modally rigid), the restriction on donkey anaphors in relation to their antecedents is that the same object(s) must verify the antecedent and anaphor clauses at every circumstance of evaluation (cf. Soames 1989b, 144-145; Neale 1990b, 130). In (68d), this means that the donkey anaphor ‘she’ (and by parity of

reasoning, the anaphor ‘he’ in (68a)) cannot take narrow scope relative to the intermediate operator (‘believe’). Suppose the anaphor *were* to take narrow scope: the anaphor clause would then be verified by the different candidates for the murderer of Smith for all John believes, and “John believes that she is insane” would denote a proposition true or false depending on whether each such person is insane at the worlds compatible with what John believes. At the same time, since the antecedent indefinite (‘someone’) occupies an extensional position *outside* the scope of ‘believe’ (‘someone’ cannot take narrow scope relative to ‘believe’), it must be taken to existentially quantify over or denote the *actual* murderer of Smith.¹⁰⁵ Consequently, the object(s) verifying the antecedent clause (the actual murderer of Smith) and the object(s) verifying the anaphor clause (the different candidates for the murderers of Smith, for all John believes) *would* be different – and the anaphoric link between the two sentences would be severed.

Similarly, consider (70a) and (70b) in a scenario where some of the prisoners have pen pals, and in every case, the pen pal is a man posing as a woman.

(70a) Every prisoner who has a pen pal thinks that he is a woman/female.

(70b) Every prisoner who has a pen pal thinks that #she is a woman/female.

(70a) has a quantificational donkey anaphoric reading, where every prisoner thinks that his male pen pal is female. Crucially, (70b) can only mean that every prisoner who has a pen pal thinks that some contextually salient female is a woman. Now consider (71), which results from replacing the donkey anaphor ‘he’ in (70a) with the minimal description, ‘the pen pal’:

(70) Every prisoner who has a pen pal thinks that the pen pal is female.

¹⁰⁵Since Neale (1990b, 130-131) cites Soames’ criticism of Evans approvingly, it is surprising that he does not recognize the tension with his claim that the de dicto readings of examples like (62a) (repeated below) are “technically available, but equally unlikely”.

(62a) A man murdered Smith, but John does not believe that he murdered Smith.

According to Neale, the problem with Evans’ identification of donkey anaphors with rigid designators or definite descriptions with obligatory wide scope is that “at different circumstances of evaluation the clauses containing their antecedents will be verified by different objects in which case the pronoun will refer to different objects (or a different object) at different circumstances” (1990b, 130). However, the antecedent clause will range over different objects just in case it occurs under an intensional operator – unlike the antecedent ‘a man’ in (62a). (By contrast, given that the examples that Evans discusses are ones where donkey anaphors have antecedents that occur in extensional contexts, it is perhaps understandable that he arrives at the (false) generalization that donkey anaphors take obligatory wide scope.)

(70) has both a de dicto and a de re reading. The minimal description ‘the pen pal’ supports both the de dicto anaphor in (71a) and the de re anaphor in (71b).

(71a) Every prisoner who has a pen pal thinks that the pen pal is female and that he loves him.

(de re only)

(71b) Every prisoner who has a pen pal thinks that the pen pal is female and that she loves him.

(de dicto only)

What we have done here and in (69a)/(69b) above is to use the presuppositions associated with a pronoun anaphoric on a definite description as a guide to the scope-taking potential of the descriptions (something that can otherwise be difficult to reliably determine).¹⁰⁶ However, the very fact that the anaphors in examples like (69a)/(69b) and (71a)/(71b) can be used to discern the scope of the donkey description is an indicator of the underlying problem: that while the donkey definite descriptions can take wide or narrow scope, the scope of the anaphor is entirely determined by the scope of its antecedent. Thus a de dicto reading of a donkey sentence requires that it be possible to interpret the antecedent material on which the values of the donkey anaphor depends in the scope of an operator. However, since the antecedents of the anaphors in Evans’ original example (62a), Davies’ (66), and in (68a) and (70a) (repeated below) cannot take narrow scope under ‘believe’, no de dicto reading is available.

(62a) A man murdered Smith, but John does not believe that he murdered Smith.

(66) A man murdered Smith. The police have reason to think he injured himself in the

¹⁰⁶ As Heim (1992, 211) notes:

When we hear somebody say that John thinks his dog is sick, do we understand that John takes himself to be in a world where the dog he has there is sick, or do we rather understand that John ascribes illness to his dog under some acquaintance relation or other? Under ordinary circumstances, where people know whether they own dogs, are acquainted with their dogs, and rarely encounter them unrecognizably disguised, one is true of John just in case the other is. So we couldn't really tell whether we construe the utterance *de dicto* and infer the truth of a *de re* reading, or the other way round.

Of course, we can tell a story, as Davies does in connection with (62), about how the police or John cannot finger any particular individual as the murderer of Smith (cannot point to him or refer to him by name), and perhaps have multiple suspects in mind. However, the facts of the story do not eliminate the de re reading. On many accounts of the de re, (62) will be true on a de re reading if John believes e.g. that *whoever left this trail of blood that we observe is the murderer of Smith*, since ‘whoever left this trace of blood’ is an acquaintance-based description. The most straightforward ways to test for a de dicto reading is to eliminate the de re reading is to employ the anaphora test above or select a description (‘the murderer’/‘the woman’) that does not pick out the actual murderer of Smith.

process.

(68a) Someone murdered Smith. John believes that he is insane.

(70a) Every prisoner who has a pen pal thinks that he is a woman/female.

Thus, while it is true that donkey anaphors do not take *obligatory* wide scope (as Evans originally maintains),¹⁰⁷ the kernel of truth in Evans' puzzle is that definite descriptions (even minimal ones) are in principle free to take wide or narrow scope and are not bound by the requirement on donkey anaphors that their verifiers be identical to the objects that verify an antecedent term. Consequently, by replacing donkey anaphors with definite descriptions, we *do* often generate de re/de dicto ambiguities not associated with the original donkey sentences. The same point holds even if the donkey anaphor is interpreted as a minimal description like 'the murderer'; as we have seen, simply paring down the descriptive content assigned to the anaphor is not enough to eliminate the problematic de dicto reading predicted for examples like (68a).

Context: A man murdered Smith. John believes that the murderer is a woman.

(68a) Someone murdered Smith. John believes that *he* is insane.

(68b) Someone murdered Smith. John believes that *the person* is insane.

Although this strategy makes it more *difficult* to obtain de dicto readings (the de dicto reading of (68b) is *harder* to coerce), it does not eliminate them entirely. So what is to be done?

Elbourne's observation that the de dicto readings of Evans' donkey sentences are marginal when donkey anaphors are replaced by minimal descriptions and his observation that minimal

¹⁰⁷For example, there can be both de dicto and de re readings of donkey sentence like (a), where the anaphor 'it' is anaphoric on a definite description ('the donkey'), which can take either wide or narrow scope relative to 'believe'.

(a) John bought a donkey. Mary believes the donkey is lame and that it needs vaccinating.

Suppose that the donkey John bought is male, but that Mary believes that the donkey is female. Observe that there are donkey anaphoric readings of both (b) and (c), where the neuter pronoun in (a) is replaced with a masculine and feminine pronoun, respectively.

(b) John bought a donkey. Mary believes the donkey is lame and that he needs vaccinating.

(c) John bought a donkey. Mary believes the donkey is lame and that she needs vaccinating.

In (b), the donkey reading is a de re reading, where the definite description must be interpreted with wide scope in order to support the anaphor 'he'. (b), by contrast, the donkey reading must be a de dicto reading, since the anaphor 'she' cannot refer to the (male) donkey John actually owns. The de dicto reading is available here (and presumably, therefore, also in (a)) because the definite description can take narrow scope and be verified by the existence of various candidates for John's donkey, given what Mary believes.

descriptions do not easily accommodate are closely connected with one another. The de dicto reading of a definite description like ‘the person’ in (49b) requires that the definiteness presuppositions of the minimal description filter or ‘locally accommodate’ under the attitude verb. Since, presumably, there are many candidates for the reference of ‘the person’ in the set of situations or worlds compatible with what John believes, accommodating the presupposition *that there exists some unique person* will require that conversational and broader contextual factors deliver an appropriately restricted set S of situations relative to which a unique value for ‘the person’ can be found. However, so long as this presupposition *can* be accommodated, then (as Elbourne observes in connection with the contrast between ‘a woman’ and ‘the woman’ in (39) and (40)), we can make sense of the de dicto reading of the sentence. In order to block this reading, it seems essential to disassociate donkey anaphors with definiteness presuppositions – with the existence and uniqueness presuppositions characteristic of definite descriptions. Any definite description that goes for a donkey anaphor associated with definiteness presuppositions will, when these presuppositions are accommodated, introduce new values (in the manner of indefinites) into the set of evaluation situations – values that do not correspond to the values introduced by the donkey antecedent. Consequently, in order to capture the restriction on donkey anaphors in relation to their antecedents (that their values *covary*), and to ensure that the only values that donkey anaphors take correspond to the values that their antecedents introduce, the proxies for donkey anaphors cannot incorporate these presuppositions. However, since definite descriptions are distinguished by the definiteness conditions they impose (on a Fregean view, they are type e referring expressions that trigger existence and uniqueness presuppositions), this means that donkey anaphors cannot be interpreted as definite descriptions.

4.4 Some consequences for D-type theories

4.4.1 Must we go dynamic?

If donkey anaphors are not definite descriptions, then what are they? A number of the considerations raised in this chapter suggest that an adequate semantics for donkey anaphors must look *amfully like*

the semantics associated with dynamic theories. Donkey anaphors covary with their antecedents by quantification over fine-grained situations that resemble assignment functions. They are not definite descriptions and lack descriptive contents apart from feature-based presuppositions and the predicates ‘D’ and ‘N’. At the same time, Schlenker (2011) suggests, it is natural to think of ‘D’ and ‘N’ as simply playing the role of indices, since these predicates are not morphologically realized and their only function is to link the value of anaphors to the value of their antecedents, thus bringing “the situation-theoretic analysis... one step closer to its dynamic competitors” (2011, 349). If ‘D’ and ‘N’ *do* correspond to indices, then it is highly plausible that donkey anaphors really do correspond to dynamically bound variables. This, of course, is not Elbourne’s view. Elbourne does not specify precisely which properties correspond to the properties *distinguished* and *non-distinguished*, indicating only that *the distinguished f* (for some property *f*, corresponding, on Elbourne’s view, to the content of a deleted NP) is the individual whose *f*ness is not a constituent of the innermost situation, s_5 .¹⁰⁸ The important point, however, is that ‘D’ and ‘N’, according to Elbourne, *describe* individuals by reference to their properties – even if these properties are rather non-standard ones.

One apparent problem for the view that there is a way to descriptively relate the values of donkey anaphors to the values of their antecedents involves sentences like (72) below (‘self-complementing bishop sentences’) (Szabolcsi, cited in Barker and Shan 2008; Kroll 2008).

(72) If a bishop talks with a bishop, he compliments him.

Although we have been supposing that bishop sentences involve a *pair* of bishops, sentences like (72) are compatible with situations involving a single bishop who both talks with and compliments himself.¹⁰⁹

¹⁰⁸ Elbourne’s idea is presumably not that ‘distinguished’ denotes a property that an individual x has in virtue of the existence of some proposition (corresponding to a set of situations) in which x occupies a particular structural position, but that *distinguished* picks out x relative to situations in something like the way that that character of ‘you’ might pick out x relative to a context in which x is the addressee – by reference to a property that x has in virtue of her role relative to a particular model theoretic representation of a part of an actual or possible world. (Of course, since the notion of ‘context’ is grounded in the notion like *speaker*, *agent*, *present time*, etc of which have independent grasp, the analogy does not completely dispel the mystery concerning the nature of Elbourne’s properties.)

¹⁰⁹ It is interesting to compare (72) with examples like (a):

(a) If a bishop talks to a bishop, the one bishop compliments the other bishop.

In the regular bishop sentence case in (73), we will recall that Elbourne maintains the restrictor clause, (74), has the logical form displayed in (75).

(73) If a bishop meets a bishop, he blesses him.

(74) a bishop meets a bishop

(75) $[[a \text{ bishop}] [\lambda_6 [[a \text{ bishop}][\lambda_2 [t_6 \text{ meets } t_2]]]]]$ (Elbourne 2005, 146)

Elbourne proposes that the inclusion relations among the situations denoted by the restrictor, “mirror the inclusion relations among the syntactic constituents of the sentence” (2005, 147).

(76) $[s_3 [s_2 \times \text{bishop}] [s_5 [s_4 y \text{ bishop}] \times \text{meets } y]]]$

Applying the same general strategy in the case of (72), we might expect that the antecedent of the self-complementing bishop sentence to denote the situation structure represented in (77):

(77) $[s_1 [s_3 [s_2 \times \text{bishop}] [s_5 [s_4 y \text{ bishop}] \times \text{talks with } y]]]$

The difficulty is that since the bishop in s_4 could be identical to the bishop in s_2 , s_3 collapses into s_5 , and s_2 collapses into s_4 . Consequently, (78) rather than (77) displays the situation structure determined by the antecedent clause (where the inclusion relations among the syntactic constituents of (72) are *not* mirrored by the inclusion relations among the set of situations characterized by the antecedent).

(78) $[s_1 [s_3=s_5 [s_2= s_4 \times \text{bishop}] \times \text{talks with } x]]]$ (Elbourne 2010, 71)

The problem that this case raises is that *there is no distinguished bishop* in situation structures of the kind represented in (78) – the property *distinguished* is defined only for structures like (76) and (77).¹¹⁰ Since

In contrast with (72), (a) strongly suggests that there is more than one bishop at issue – it cannot faithfully describe a situation in which a bishop compliments himself. Since the Predicates ‘Distinguished’ and ‘non-distinguished’ perform a similar function as ‘one’ and ‘other’ in (a), one might expect that (72) would also be incompatible with situations in which a bishop compliments himself, contrary to fact.

¹¹⁰ This version of Kroll’s objection is due to Elbourne. According to Kroll, the problem with appealing to the predicates *distinguished* and *non-distinguished* is that we get an interpretation of (72) on which the sentence is true just in case the distinguished bishop relative to a structure like (77) blesses the non-distinguished bishop, and this “incorrectly predicts that situation s_8 [the most inclusive situation] contains at least two bishops” (Kroll 2008, 368). Presumably, the idea is that assigning the pair of definite descriptions ‘the distinguished bishop’ and ‘the non-distinguished’ bishop to the anaphors in (72) generates a presupposition for (72) (*that there exists a unique distinguished bishop and there exists a unique non-distinguished bishop*) that can only be satisfied – assuming that the properties of *distinguished* and *non-distinguished* are mutually exclusive – if there is more than one bishop. However, Elbourne specifies that the properties *distinguished* and *nondistinguished* are in fact undefined for structures like (78) (which display the real structure of (72)). If so, then assigning the pair of definite

both x and y fall under the NP ‘bishop’ and neither falls under the NP ‘distinguished’, the problem of indistinguishable participants appears to have been reinstated. Elbourne’s predicates ‘D’ and ‘N’ cannot solve the problem of indistinguishable participants in full generality, since these NPs do not have application in self-complementing bishop cases.

The problem that examples like (72) raise for Elbourne’s analysis is not simply one of scope. The broader problem is that, if there are no descriptive predicates to supply to the anaphors in self-complementing bishop sentences, then some *non-descriptive* mechanism will need to be invoked. However, since it is plausible that whatever non-descriptive mechanism accounts for self-complementing bishop sentence cases will have more general application – to regular bishop sentence and non-bishop sentence donkey anaphora – these cases threaten to confirm Abbott’s more radical conjecture that the moral of the problem of indistinguishable participants that donkey anaphora is not established descriptively *at all*.

In fact, Elbourne argues, there *is* a descriptive solution to self-complementing bishop sentence cases.¹¹¹ The solution he proposes involves defining a *new* set of predicates, ‘D*’ and ‘N*’ to replace ‘D’ and ‘N’:

*D** An individual x is distinguished* with respect to a situation s iff either s is an extension of a situation with the structure of s_1 in [(76)] and x is distinguished (as originally defined) in s or x is the only individual in s .

*N** An individual x is nondistinguished* with respect to a situation s iff either s is an extension of a situation with the structure of s_1 in [(76)] and x is nondistinguished (as

descriptions ‘the distinguished bishop’ and ‘the non-distinguished’ bishop to the anaphors in (72) will not generate a presupposition that entails that there is more than one bishop. The problem occurs at an earlier stage, since the definite descriptions simply do not have application in cases like (72) in the first place.

¹¹¹ Barker and Shan (2010) suggest that identity between thin particulars might be omitted from situations in the way that properties like *bishophood* can be. It is hard to know what to make of this suggestion. Even if we are comfortable with the idea that individuals are *thin particulars* in the sense of Armstrong (1978) (I have been assuming this throughout), *self-identity* does not appear to be the sort of property that can be abstracted away from an individual in the way that *bishophood* can be. (If, for example, the thin particular corresponding to an individual a was not identical to itself relative to a situation s , then there is no x in s which is identical to a – and thus nothing identical to the *distinguished bishop* in s – since that thing would be identical to a .) There may be some way of implementing this suggestion on a counterpart theoretic approach, but I will not pursue the matter here.

originally defined) in s or x is the only individual in s .

The idea here is that the main clause of (72) will be interpreted “the distinguished* bishop talks with the nondistinguished* bishop”, where the definite description “the distinguished* bishop” picks out the distinguished bishop if the antecedent of (72) characterizes a situation structure like the one associated with the original bishop sentence, and picks out the unique bishop in s if (72) does not characterize a situation structure of that kind. Since the antecedent of (72) does *not* characterize a situation structure like the one associated with the original bishop sentence, “the distinguished* bishop” picks out the unique bishop, as desired. (Analogously, for ‘the non-distinguished* bishop’.)

Elbourne’s solution is complex, but surprisingly robust.¹¹² Assuming it succeeds, then – contrary to what is usually supposed – the problem of indistinguishable participants seems to be a problem for *dynamic theories*, rather than (Elbourne’s version of) the D-type theory, which both accounts for donkey anaphora in regular (asymmetric) bishop sentences (including self-complementing cases) and for the absence of donkey readings in symmetric bishop sentences like (79) (Elbourne 2005, 145-146).

(79) If a bishop and a bishop meet, he blesses him.

As we saw in §4.3.4, Elbourne explains the unavailability of (79) by appealing to the fact that there is

¹¹² Of course, the complexity of Elbourne’s solution might itself be cause for concern. Kroll argues:

The properties expressed by distinguished and nondistinguished need to be salient to interpreters of bishop sentences so that they can use these properties to supplement the content of the otherwise improper definite descriptions that serve as interpretations of the donkey pronouns in the consequent of bishop sentences. However, these properties are salient to interpreters only if the complex situation structures Elbourne assigns to bishop sentences are salient to such interpreters. I find it extremely implausible that such complex situation structures are ever, to any degree, salient to interpreters of bishop sentences... [and hence] that the properties expressed by distinguished and nondistinguished are salient to interpreters of bishop sentences. (2008, 368-369)

In response, Elbourne claims that Kroll “[assumes] a picture of the semantic aspects of language according to which things are more transparent and straightforward than they really are” (2009, 75). According to Elbourne, complex situation structures need not be salient in the sense of ‘salient to consciousness’. He points out that there are many similar cases where “speakers and hearers sometimes [do not]... have any conscious knowledge” of the nature of the contextually-supplied properties and relations that contribute to semantic interpretation e.g. “of which properties they are using the supplement the descriptive content of an improper definite description” (ibid). Elbourne is surely right that speakers do not always have reflective access to the ways that context contributes to the interpretations of ordinary terms and constructions – moreover, it is familiar that the underlying semantics of ordinary terms and constructions may involve structures and operations of some complexity that speakers at most implicitly grasp. Still, it would be helpful to have something closer to the intuitive grounding for the properties D and N (and the derivative properties D^* and N^*) that we have for properties defined relative to more familiar kinds of evaluation structures, such as contexts or indices.

no difference in the NPs associated with the antecedent indefinites *and* no difference in the way the two indefinites are treated as far as the construction of the situations characterized by the antecedent. Meanwhile, since the conjoined indefinites are semantically distinct, Elbourne also predicts that the donkey anaphoric reading will re-emerge in the minimally different (80).

(80) If a bishop meets a nun, he blesses her.

By contrast, cases like (79) and (80) appear to raise a pair of problems for dynamic theories. Dynamic theories must explain both the availability of the donkey anaphoric reading of (80), and the contrasting *un*availability of the donkey anaphoric reading of (79). The difficulty is that it is not clear how to satisfy both desiderata. To predict the donkey reading of (80), the indefinites must be permitted to bind the pronouns in the main clause. The danger, as Elbourne points out, is that “whatever mechanism [is] use[d] to do this will automatically ensure that the pronouns in the main clause of [(79)] are bound by the indefinites *a bishop and a bishop*” (2009, 14). Dynamic theories cannot, according to Elbourne, explain the contrast between (79) and (80) by adverting to the fact that the antecedents are semantically distinct, since dynamic theories, by definition, do not explain the link between donkey anaphors and their antecedents by appealing to descriptive contents; on these theories (Elbourne claims) the differences in the descriptive associated with the NPs ‘bishop’ and ‘nun’ should be *irrelevant*.

However, as Barker and Shan (2008) argue, it is not clear that the dynamic theorist *cannot* appeal to symmetry-breaking descriptive contents. They propose that the donkey reading of (79) is available *in principle*. Symmetric bishop sentence anaphora is merely “pragmatically irresolvable”, since is no way of “deciding which of the possible anaphoric relations is the intended one” (i.e. whether the first or second occurrence of ‘a bishop’ binds ‘he’ or ‘him’) (2008, 34). By contrast, the symmetry is broken in (80) because of the difference in the descriptive contents associated with the antecedent indefinites.

According to Elbourne, the problem with this account of the unavailability of the donkey reading of (79) is that the original bishop sentence is *also* “ambiguous between a reading in which ‘the

first bishop blesses the second bishop’ and one in which ‘the second bishop blesses the first bishop’” (according to some informants) (Elbourne 2005, 153). If the same ambiguity is present in the *original* bishop sentence – if there is no way of deciding which of the possible anaphoric relations is intended *either* for the regular, asymmetric bishop sentence *or* for the symmetric bishop sentence in (79) – then something *other* than pragmatic irresolvability must be responsible for the infelicity of the donkey reading in the symmetric bishop sentence case.

One problem with Elbourne’s response to Barker and Shan is that it is not entirely clear that the dynamic theorist cannot help herself to some of the same descriptive resources that Elbourne uses to derive the contrast between the symmetric and asymmetric donkey readings – while assigning them a merely pre-semantic or pragmatic role in the way that Barker and Shan suggest. The alternative view of the role of descriptive contents in licensing donkey anaphora that emerges from Barker and Shan’s criticism is one on which descriptive contents can serve as an aid to anaphora resolution – but not as the fundamental means through which the covarying reading is generated. The dynamic theorist might maintain that while in the symmetric bishop sentence case “the overall situation is symmetric enough that donkey anaphora becomes infelicitous”, the symmetry is broken in the asymmetric bishop sentence case because there is a difference in the underlying evaluation structure mirroring the syntactic structure of the sentence, which generates a difference in the descriptive properties associated with the pair of bishops (2008, 34). This descriptive difference is enough to make the pragmatic resolution of asymmetric bishop sentence anaphora possible.

On this alternative account of the role of Elbourne’s descriptive contents, (i) donkey anaphora (or rather, anaphora resolution, more generally) requires a principled way of determining what the intended anaphoric relations are, and (ii) descriptive contents are one kind of guide to the intended anaphoric relations – but do not play a semantic role. There is, however, a serious difficulty with this proposal, involving self-complementing bishop sentences. If we follow Elbourne, these cases are ones in which the situation structures relative to which D and N are defined collapse into simpler structures that do not contain a distinguished bishop. The alternative descriptions associated with the

anaphors, ‘the distinguished* scholar’ and ‘the non-distinguished* scholar’ pick out the *very same individual*. Crucially, since the two definite descriptions pick out the same individual, they do not link the values of the donkey anaphors to the values contributed by one or the other indefinite. The difficulty this raises for Barker and Shan’s view of the role of descriptive contents (that descriptive contents are a pragmatic aid to anaphora resolution) is that these are cases where there is no principled way to link the values of the anaphors to the values of one or the other antecedent indefinite. Whereas Elbourne’s account avoids having to link the values of the anaphors to the values of one or the other indefinite, the dynamic theorist cannot avoid this. On these views, each anaphor must be linked to (bound by) one of the antecedents (different ones). However, since there is no way of determining the intended anaphoric relations, any such link will be *arbitrary*. If anaphoric readings *were* infelicitous when there is no way of determining the intended anaphoric relations (cf. commitment (i) above), the self-complementing bishop sentence should be infelicitous, contrary to fact. Consequently, dynamic theories *cannot* appeal simply to the fact that there is no way of “deciding which of the possible anaphoric relations is the intended one” in order to explain the infelicity of symmetric bishop sentences, and to the symmetry-breaking descriptive difference Elbourne proposes in order to explain the availability of the donkey readings of regular bishop sentences.

Of course, the dynamic theorist might maintain that it doesn’t *matter* how the anaphoric relations are understood in self-complementing bishop cases – that the anaphors can be indexed to the antecedent indefinites in any which way, since “which anaphoric configuration is chosen has no affect on the truth-conditions” of the self-complementing bishop sentence (Elbourne 2009, 5). As Elbourne (2009) points out, however, this is unlikely to help, since it *also* does not matter which anaphoric configuration is chosen in the asymmetric bishop case.

(81) If a bishop meets a bishop, he blesses him.

(In a similar vein, notice that the donkey anaphoric reading of the symmetric version of the self-complementing bishop sentence *remains* infelicitous if we suppose that bishops talk only to themselves.

(82) If a bishop and a bishop talk, he compliments him.

The mere fact that it does not matter which anaphoric configuration is chosen in (82) is not enough to *recover* a donkey reading for the sentence.)

4.4.2 A prolegomenon

There therefore appears to be a compelling case to be made for the view that donkey anaphora is established descriptively. Regular bishop sentences and reflexive bishop sentences, which initially seemed problematic for D-type theories, appear to admit of descriptive solutions. It initially seemed that the dynamic theorist *might* account for the contrast between symmetric and asymmetric bishop sentences by appealing to the pragmatic irresolvability of asymmetric bishop sentence anaphora, on the one hand, and the descriptive resources Elbourne applies to asymmetric bishop sentence cases, on the other. However, these two strategies turned out to be at odds with one another in self-complementing bishop cases. In these cases, donkey anaphoric readings are possible *despite* the fact that there is no way to determine the intended anaphoric relations.

How are we to reconcile these observations with the arguments in §4.2-4.3 that donkey anaphors do not have the definiteness presuppositions or predicative contents of standard D-type definite descriptions? While my aim in this chapter is not to offer an alternative view of the semantics of donkey anaphors, it is worth noting a couple of reasons why the materials left to D-type theories *might* be enough to yield a viable D-type account of donkey anaphora.

As we observed at the end of §4.2, the view that donkey anaphors are associated with feature-based contents and with optional, contextually-supplied properties like D^* and N^* makes good predictions in a range of bishop sentence cases. In regular bishop sentences, the deleted NP ‘bishop’ does not play a constructive role in deriving bishop-sentence anaphora.

(83) If a bishop meets a bishop, he blesses him.

In these cases, the weight of the task of establishing the relation between the values of the anaphors and antecedents falls instead to Elbourne’s D^* and N^* . Consequently, there is no need in these cases

to associate the anaphors with contents apart from those that appear on their surface in the form of features. Nor do we need to associate the anaphors with definite articles in order to ensure that they take on just one value, given a natural view of the properties *distinguished* and *non-distinguished*. Following Barker and Shan (2008, 24) we can suppose that these properties are specified in something like the following way (the following formulation departs somewhat from Barker and Shan's own):

An individual x is distinguished relative to an individual y in a set of situations S just in case there is some $s \in S$ that contains both x and y and the fact that x is f , but not the fact that y is f .

On this account of what the property of being *distinguished* corresponds to, there will either be one value, or no value, for whichever donkey anaphor encodes the property *distinguished-f* relative to the situations in S , since a situation is distinguished just in case it includes the f -ness of x but not of y .¹¹³ (On this view proposed in this chapter, the value of f will not correspond to the property denoted by an antecedent NP, but to the property (or conjunction of properties) associated with the phi-features of the anaphor.)

Meanwhile, symmetric bishop sentences like (84) are correctly predicted *not* to have donkey readings, since (a) the feature-based contents of the anaphors are not enough to distinguish their values relative to situations containing a pair of bishops, and (b) the predicates 'D*' and 'N*' are not defined relative to the situation structures determined by these sentences.

(84) If a bishop and a bishop meet, he blesses him.

By contrast, the donkey readings of symmetric bishop sentences like (85) *are* predicted, since the contents encoded by the phi-features of the pronouns are enough to determine a unique value for each of the anaphors (without associating the anaphors with the NPs 'bishop' and 'nun').

(85) If a bishop and a nun meet, he blesses her.

Finally, and importantly, the unavailability of the donkey reading of (86) is predicted since the anaphors are associated with the same semantic features (as in (84)) and there is no distinguished

¹¹³ Of course, this definition will have to be generalized for $n > 2$ participants.

individual in the set of situations characterized by the antecedent clause. As we saw, Barker and Shan (2008, 34) argue that cases like (86) pose a problem for Elbourne's proposal, since the donkey anaphoric reading of (86) is infelicitous even though the conjoined indefinites are semantically distinct.

(86) If a butcher and a baker meet, he pays him.

As Elbourne (2009) observes, a donkey reading of (86) can be recovered in a suitable context e.g. one in which it is common ground that butchers (but not bakers) are generally in arrears. However, absent appropriate contextual cues, (86), like (84), cannot be given a donkey reading.

One way for Elbourne to explain the absence of a donkey reading of (86) in an out-of-the-blue context is for him to appeal (in the way that Barker and Shan do) to the symmetry of the situation and the fact that speakers must be able to decide in a principled way which D-type description to assign to which anaphor. As we saw in the previous section, however, scholar sentence cases appear to show that donkey anaphora does not require a principled way of resolving anaphoric links between donkey anaphors and their antecedents. Consequently, symmetric bishop sentences seem to pose a problem for Elbourne's D-type theory as well as for dynamic theories.

The naïve view might seem to suffer from a version of the same problem that (86) raises for Elbourne's NP-deletion theory, illustrated by cases like (87):

(87) If a butcher and a baker meet, she pays him.

It is not altogether clear that the donkey anaphoric reading is available in this case either. Here, however, there seems to be no way to explain the infelicity of the donkey anaphoric reading by appealing to feature-based contents, since the anaphors have *different* features.

In fact, the naïve view supplies a natural way to explain the infelicity of the donkey reading of (87) *without* appealing to pragmatic irresolvability-type strategies. Unless it is contextually clear that either butchers or bakers are female (in which case, the donkey reading is felicitous), the presupposition that the anaphor 'she' picks out a female individual is not satisfied (analogously for 'he') since it is not common ground that there is some female individual (a butcher or baker) in the

set of situations characterized by the antecedent clause. That is, (87) is a presupposition failure, unless it is contextually clear that the values contributed by one or other indefinite (the relevant butchers or bakers) are women. By contrast, the presuppositions of the pair of Elbourne-style D-type descriptions, ‘the butcher’ and ‘the baker’ *are* satisfied, since there exists a unique butcher and a unique baker in each situations characterized by the antecedent clause.

At the same time, Elbourne (pc) observes that it is not clear whether examples like (88)-(90) can be dealt with if donkey anaphors do not encode richer descriptive contents like deleted NPs:

(88) Deep anaphora (Jacobson 2000)

A faculty member picks up her first paycheck. Waving it in the air, she says:

Do most faculty deposit it in the Credit Union?

(89) Classic paycheck sentences (Cooper 1979)

John gave his paycheck to his mistress. Everyone else put it in the bank.

(90) Classic pronouns of laziness (Geach 1962)

This year the President is a Democrat. Next year he will be a Republican.

(88) illustrates the phenomenon of ‘deep anaphora’, where a pronoun receives a covarying interpretation even though it is not associated with a linguistic antecedent of any kind. The covarying interpretation of (88), roughly, *that for most faculty members x , x deposits x ’s paycheck in the Credit Union*, appears to require that the pronoun ‘it’ range over the paychecks of the relevant faculty members. Meanwhile, (89) and (90) illustrate what Elbourne (2005) calls ‘the problem of neontological pronouns’, which introduce new entities into the discourse. In (89), the paycheck that everyone but John puts in the bank is not *John’s* paycheck but his or her own, while the president who will be Republican, according to (90), is not this year’s (Democratic) president but the next president elect. In order to capture these readings, Elbourne argues, it is essential to assign the donkey anaphors richer descriptive contents like ‘the paycheck’/ ‘the president’.

(88’) Do most faculty members deposit *the paycheck* in the Credit Union?

(89’) Everyone else put *the paycheck* in the bank.

(90') Next year, *the president* will be Democrat.

At the same time, even these richer descriptive contents are not enough to capture the covarying readings of (88)-(90). Observe, for example, the truth-conditions of (89), represented in (91) below, require there to be some unique paycheck in every situation s' that some individual distinct from John puts in the bank. Since there is no mention of paychecks in the antecedent clause, however, there are no paychecks in any situation s' in the set it denotes.

(91) λs . for every individual x : for every minimal situation s' such that $s' \leq s$ and x is person not identical with John in s' , there is a situation s'' such that $s'' \leq s$ and s'' is a minimal situation such that $s' \leq s''$ and x put in the bank in s'' the unique y such that y is a paycheck in s'' .

How, then, do paychecks enter into the set of extended situations s' ? Elbourne offers two different proposals. The first involves the claim that 'his' in 'his paycheck' occurs, at LF, within an NP, so that (89) has the structure represented in (92)

(92) John gave [DP the [NP paycheck of him]] to his mistress. Everybody else put [DP it [NP paycheck of him]] in the bank.

The individual variable 'his' is part of the deleted material in the second sentence, and can be bound by 'everybody else'.

Elbourne's second proposal involves *accommodating* the existence of a unique paycheck in each situation s' . As we saw earlier, Elbourne maintains that minimal descriptions like 'the paycheck' do not accommodate easily. (Recall that this is how he accounts for the contrast between "Every man loves the woman" and "Every man loves a woman".) He suggests, however, that accommodation is possible in an example like (89), since the discourse "explicitly contrasts the behavior of John and other people with respect to their paychecks, and is most naturally delivered with contrastive stress on both 'John' and 'to his mistress', which would warn the listener than some other kind of location for people's paychecks is forthcoming" (2005, 82). Similarly, (88) explicitly contrasts the party membership of this year's and next year's president, while the accommodation in (90) of a paycheck for every faculty member might be possible because of the speaker's demonstration of her own paycheck.

Notice that both of these strategies depend on an assumption that has been argued against in this chapter. The first strategy depends on donkey pronouns containing deleted NPs as well as feature-based contents (the claim disputed in §4.2). The second depends on donkey anaphors being interpreted as definite descriptions, which carry uniqueness and existence presuppositions that can undergo accommodation (whereas it was argued in §4.3 that donkey anaphors are not equivalent to definite descriptions precisely because they are *not* associated with presuppositions that accommodate in the way that those of definite descriptions do).

Although neither of Elbourne's proposals in connection with (88) can be adopted, the basic resources of Elbourne's semantics, together with Elbourne's (2010) situation semantics solution to the problem of quantifier domain restriction may provide the resources to account for the covarying readings of (88) and (89) without departing from the position that donkey anaphors are not associated with deleted NPs or definiteness presuppositions. Consider the following classic example of quantifier domain restriction from Soames (1986):

(92) Everyone is asleep and is being monitored by a research assistant.

Suppose that (92) is uttered by a researcher conducting a sleep experiment. Her intention is to convey that every subject in her experiment is asleep – rather than every person in the world or in the lab (including every research assistant) is asleep. There are a variety of proposals for capturing this restricted interpretation. On some views, quantifier domain restrictions enter as the values of items in syntax – for example, syntactically realized situation variables that narrow down the domain of quantification (Recanati 1996, 2004; Kratzer 2004), or syntactically realized variables over relations associated with quantifier phrases (either with the nominals or with the quantificational determiners themselves; cf. von Stechow 2004 and Stanley and Szabo 2000 for these two approaches). On free enrichment type views (Sperber and Wilson 1986, Carston 2002), implicit content is not the argument to a syntactically realized argument place, and is instead the product of a free enrichment process of the kind discussed in Chapter 3.

Elbourne himself advocates a version of the situation variables approach. The main idea of

this approach is that domain restriction is provided by situation variables associated with predicates like ‘one’ and ‘asleep’, which denote functions from situations to individuals. In Recanati (1996, 2004) and Kratzer (2004), situation variables occur in the syntax; on the implementation in Percus (2000) and Büring (2004), a sentence like (92) will be assigned the LF in (93):

$$(93) \Sigma_{s_8} [[\text{every} [\text{one } s_8]] [\text{is} [\text{asleep } s_8]]]$$

The semantic value of [asleep s_8] is $[\lambda x. x \text{ is asleep in } s_8]$ (the characteristic function of the set of individuals asleep in s_8). The operator, Σ_{s_8} , which is interpreted as a lambda operator, will bind any co-indexed situation variables in its scope, yielding the denotation in (94) for (93):

$$(94) \lambda s_8. \text{Everyone in } s_8 \text{ is asleep in } s_8.$$

Crucially, however, some situation variables may be referential. For example, we might instead have the LF for (92) displayed in (95), where the situation variable s_1 refers to a contextually salient set of situations:

$$(95) \Sigma_{s_8} [[\text{every} [\text{one } s_1]] [\text{is} [\text{asleep } s_8]] \text{ and } [\text{is being monitored } s_8 \text{ by a research assistant } s_8]]]$$

(95) has the denotation in (96):

$$(96) \lambda s_8. \text{Everyone in } s_1 \text{ is asleep in } s_8 \text{ and is being monitored by a research assistant in } s_8.$$

If s_1 refers to the situation containing only the experimental subjects, and s_8 includes the subjects and the research assistants, the correct reading is obtained.

As noted earlier in this chapter, Elbourne does not locate situation variables in the syntax. Instead, he obtains the effect of having the unbound situation variable s_1 in the syntax by introducing an operator s_0 , which takes a noun or NP as its argument and gives back the denotation of the nominal modified so as to take as its second argument a contextually salient situation.

$$[[s_0]]^g = \lambda f_{\langle s_e, st \rangle} . \lambda u_{\langle s, e \rangle} . \lambda s. f(u)(g(0)) = 1$$

The denotation of ‘one’ in ‘everyone’ will be as follows:

$$[[\text{one } s_0]]^{[0 \rightarrow s_1]} = \lambda u_{\langle s, e \rangle} . \lambda s. u(s_1) \text{ is an entity in } s_1.$$

‘one’ denotes the restricted property of *being an entity in s_1* . Where s_1 is a situation containing just the experimental subjects, this will be semantically equivalent to the property of *being an experimental subject*.

How does Elbourne’s solution to the problem of quantifier domain restriction assist with examples like (88) and (89) above? The central idea is that rather than accommodating the existence of paychecks in the minimal extended situations that interpret the anaphor clauses in (88) and (89), we take the antecedent quantifiers to quantify over to minimal situations containing *paycheck-holding* faculty members, in (88), or alternatives to John, in (89). Since, as Elbourne observes, the sequence in (89) sets up a contrast between the behavior of John and the other people in respect to their paychecks, the set of individuals that the quantifier ‘everyone else’ quantifies over will not be the set of all individuals whatsoever, but other paycheck-holders. This restriction on the domain of quantification will have to be captured somehow or other – on Elbourne’s approach, by setting the value of the situation variable s_1 to the set of paycheck-holding faculty/alternatives to John. But once the domain of quantification for ‘everyone else’ in (89) and ‘most faculty’ in (88) is restricted in this way, there is no need either to accommodate the existence of paychecks in the extended situations denoted by the anaphor clauses or to assign the donkey anaphors richer descriptive contents. The feature-based descriptive content of the donkey anaphor ‘it’ will suffice in to pick out the paycheck of each individual in the restricted set of situations quantified over.

There may be some way to extend this approach to examples like (90), though I will not pursue the issue here.¹¹⁴ This sketch of an account of (88) and (89) is meant only to illustrate that these examples do not clearly show that the case for D-type theories is hopeless once the traditional model of the definite description is abandoned in favor of a pared-down view. Nor is it clear, of course, that the resources left to D-type theories will be *enough* to handle all cases. As noted at the outset, the aim of this chapter is not to offer a constructive alternative account of donkey anaphora,

¹¹⁴ One possibility is that the set of situations relative to which the pronoun is interpreted might be restricted to situations consisting of next year’s president because of a free situation variable associated with the pronoun itself – specifically, with situation variables associated with the contents of phi-features (which presumably also carry situation variables if predicative contents generally do). I am not sure if this strategy can be made to work.

but to delimit the range of available theories.

Before turning in the following chapter to the case of proper names, it is worth registering a worry about the package of views concerning the semantics of pronouns defended in this chapter and the previous ones. In Chapters 2 and 3, I argued that it is an important advantage of Cooper's semantics for pronouns that it does not treat bound and referential pronouns as homonyms. At the same time, there is an equally good case to be made that donkey anaphors do not have a fundamentally different semantics. It is a striking fact that many different languages have referential, bound variable *and* donkey anaphoric uses of pronouns and, moreover, that pronouns used with these different meanings are not lexically or morphologically distinguished in any language (Elbourne 2005, 2). In light of these facts, it would seem desirable to have a unified semantics that encompasses each of the three uses. At the same time, however, this chapter argues only that donkey pronouns are more *similar* to bound and referential pronouns than is supposed on standard D-type theories – but not that they have the *same* semantics. In particular, while donkey anaphors are not definite descriptions and their descriptive contents are exhausted by their phi-features, they do not seem to correspond to individual variables, and are not dependent on variable assignment functions of the kind used to interpret bound and referential pronouns,

Without a worked-out theory of donkey anaphora, it is difficult to assess the claim that we *are* left with a disunified account of referential, bound variable and donkey anaphoric pronouns. For example, the status of the claim that donkey anaphors cannot be represented as individual variables dependent on variable assignments of the kind used for bound and referential pronouns depends on what we make of the arguments of Chierchia (1986), Dekker (2004), Schlenker (2011), and others that fine-grained situations are equivalent to quantificational cases. Second of all, even if donkey anaphors do have a different semantics, it may be that there is a way to explain the cross-linguistic morphological facts that give the (misleading) *appearance* of semantic uniformity by appealing to the fact that bound, referential and donkey anaphoric pronouns encode the same descriptive contents. That is, it may be that what distinguishes donkey anaphoric pronouns and their referential and bound

variable counterparts is the mechanism of co-variation, but that the common core of feature-based contents explains the morphological uniformity.

These remarks are speculative; as noted, it is difficult to say how and why (and, indeed, whether) donkey anaphoric pronouns differ semantically from bound and referential pronouns without a worked-out account of their semantics – a challenge that must be left for another occasion.

5 Anaphoric theories of proper names

5.0 Introduction

The previous chapters considered the prospects for variable-based treatment of *pronouns*. In this chapter, I ask how far variable-based treatments of terms with referential use can be extended – in particular, whether *proper names* should be modeled as variables, along with (as argued in Chapters 2 and 3) bound and referential pronouns.

The historical debate concerning the semantics of proper names has largely centered on the question whether the values of proper names are exhausted by their references. The referentialist answers affirmatively, conjoining the Russellian view that the semantic values of singular terms are exhausted by their references, with the Millian view that proper names are singular terms. Proper names are (as they syntactically appear to be¹¹⁵) simple referring terms, ‘connotationless’ tags that lack internal syntactic or semantic structure. The descriptivist, by contrast, takes the view that the relation between a name and its referent is mediated. The contribution of a proper name is first and foremost an intension, a Fregean *Sinn* or descriptive content of some other kind (an individual concept, set of properties ...), which serves as “criterion [of reference]... such that the referent of the name, if any, is whatever object satisfies that criterion” (Dummett 1973, 110). Syntactical versions of descriptivism take the further step of assigning proper names complex logical forms composed of operators and general terms.

¹¹⁵Of course, proper names *can* be formed with descriptive noun phrases and determiners. For example, ‘The White House’ is a proper name formed with a pair of common nouns and a determiner. However, as Kripke’s example of ‘Dartmouth’ illustrates (where ‘Dartmouth’ originally meant ‘mouth of the Dart river’ but persisted as a proper name of the town when the Dart changed course), once a string of words becomes a name, the ordinary semantic values of those words do not contribute to the semantics of the name. The name itself (on the referentialist view) lacks internal semantic structure.

There are well-known objections to both referentialist and descriptivist views of the semantics of proper names. The main objection to referentialism involves substitution failure: simple sentences that differ by substitution of co-referent proper names may convey different information (perhaps: express different propositions), while complex (e.g. belief) sentences that differ in the same way elicit different truth-value judgments. Although descriptivism can explain substitution failure by appealing to differences in the semantic contributions of the proper names (located, for example, in the mode of presentation of names or their references, in non-extensional contexts¹¹⁶), the view faces important difficulties of its own. Powerful arguments from Kripke (1972) have convinced many philosophers and some semanticists that proper names have modal, epistemic and semantic properties that distinguish them semantically and/or syntactically from descriptive terms.¹¹⁷

The intriguing possibility raised by the *anaphoric* theories of proper names that will be addressed in this chapter is that the difficulties associated with traditional referentialist and descriptivist theories arise because theories of both kinds are addressed to the wrong question, concerning the *intrinsic, non-relational* semantic values of proper names. According to proponents of anaphoric theories, proper names are a special case of *anaphoric* expression. Their semantic values are determined *relationally*, after the model of variables, rather than either individual constants (as on referentialist views) or descriptive terms (as on descriptivist views).

There are two main arguments for anaphoric theories. The first is that they explain (alleged) bound (or, more generally, anaphoric) uses of proper names. While these occurrences are not easily explained on traditional referentialist or descriptivist theories, they are said to fall out naturally from an anaphoric semantics. In addition, anaphoric theories are said to provide a novel solution to the problem of substitution failure. Substitution failure is said to occur when co-referential proper names

¹¹⁶ On a traditional Fregean view, the reference of a name in a propositional attitude construction is taken to be a sense or mode of presentation of its usual referent.

¹¹⁷ As we will see, names do not exhibit the scope ambiguities in modal constructions that are characteristic of most definite descriptions (the modal objection). In addition, the competent use of a proper name does not seem to require that speakers grasp non-trivial necessary and sufficient conditions associating the name with its bearer (the semantic objection). Finally, there also do not seem to be non-trivial a priori equivalences relating the referents of names to the unique satisfier of associated descriptions (the epistemic objection). These are the three central objections to descriptive theories of proper names found in Kripke (1972).

(names with the same *intrinsic* semantic values) enter into different anaphoric relations, and are thus associated with different *relational* semantic values.

This chapter examines a pair of recent and influential implementations of the anaphoric approach: Sam Cumming's (2007, 2008) *Variabilism*, and Kit Fine's (2007) *Semantic Relationism*. Fine and Cumming subscribe to different views of the relational values associated with proper names. According to Cumming, these values are determined by causal-historical relations of the kind familiar from causal chain theories of reference (Chastain 1975, Kripke 1972, see also Donnellan 1972 and Sommers 1982), and enter into the semantics through the (dynamic) notion of a *discourse referent*. Fine, by contrast, appeals to a different kind of relational value, determined by the *semantic requirements* on proper names that are associated with the same semantic type.

I ask whether relational semantic values of either of these kinds succeed in accounting for substitution failure and for alleged interactions between proper names and operators. I argue that they do not. Differences between co-referent proper names are not captured by relational values of the kind proposed by Cumming or Fine. The difficulties encountered by these views suggest, more generally, that the approach anaphoric theories take – explaining substitution failure by adverting to relations between linguistic items – is fundamentally mistaken. Furthermore, neither author shows that differences in the contributions of co-referential name tokens must be explained *semantically* – by appealing to *semantically significant* relational differences – and there are reasons to expect that relational differences (if any) between co-referential names will involve extra-semantic relations. One such reason is that, contrary to what proponents of anaphoric theories maintain, there is no clear evidence that the truth-conditions of sentences are in any systematic way sensitive to anaphoric relations between names or, correlatively, that proper names interact with operators – that names contribute bindable or shiftable elements. These considerations suggests that proper names are not anaphors, and do *not* have a variable-based semantics.

5.1 Anaphoric theories of proper names

5.1.1 Motivating anaphoric theories: operator-controlled uses of names?

As noted in the Introduction, there are several important properties that proper names and *free* variables appear to have in common. Many philosophers and some semanticists maintain that proper names *refer directly* – that the component of the proposition corresponding to the contribution of a proper name, like a pronoun, is an individual directly determined by the name rather than by a mediating Fregean *Sinn* or content of some other kind (individual concept, set of properties ...). Proper names are therefore said to be ‘paradigms of direct reference’, like free variables and pronouns. Indeed, proper names are in one respect *more* similar to (free) variables than referential pronouns are, since names and variables have just one kind of semantic value (while referential pronouns seem to have *two* kinds of semantic value). The values of proper names (their propositional contributions) are exhausted by the objects they refer to in the way that a variable’s “first and only” contribution to the proposition expressed by an open formula is its value (relative to an assignment).

Nevertheless, proper names are *not* traditionally modeled on variables, as pronouns are. One important reason for this is that proper names do not appear to be *bindable* in the way that variables or pronouns are. For example, despite occurring in an argument position controlled by the quantifier, the reference of the embedded occurrence of ‘John’ cannot vary with the alternate values in the quantifier’s domain in the way that the value of the pronoun ‘his’ in (2) varies (even if every pupil is named ‘John’).

- (1) a. Every pupil remembered his textbook.
b. For all x, if x is a pupil, x remembered x’s textbook.
- (2) a. Every pupil remembered John’s textbook.
b. For all x, if x is a pupil, x remembered John’s textbook.

Thus whereas the main difficulty for the view that pronouns correspond to variables involves an apparent disanalogy between *free* variables and referential pronouns, the disanalogy between proper

names and variables seems greatest in the *bound* case (variables have a *bound* use that proper names appear to lack).

The more general problem with the analogy between proper names and individual variables is that proper names do not seem to be *parametric* in the way that pronouns and individual variables are. The references of proper names do not vary with the values of parameters in the way that the values of free variables vary under different assignments, or as a function of *context of use* in the way that the values of pronouns do. Of course, when a name is used in conversation or text, one can ask to whom or what the name refers; one may not know *which* man called ‘Aristotle’ is spoken of when someone says, “Aristotle was wise”. With proper names, however, it is generally supposed that we have *ambiguity*, rather than any kind of parameter-dependence (e.g. indexicality); context *disambiguates* the proper name, but does not determine its reference in the sense of assigning some individual as its value. However, if the values of proper names do not vary *either* with the values of quantifiers or other variable-binding operators *or* as a function of parameters set by an occasion or context of use, then it is not clear in what sense names are properly said to exhibit *variable-like* behavior. Instead, they seem – and are widely held to be – more like *individual constants*, than variables.

According to some authors, however, proper names *do* have bound (or, more generally, *anaphoric*) uses, contrary to what cases like (2) above appear to show (Yagisawa 1984, Geurts 1997, Dever 1998, Elbourne 2005, Cumming 2008, inter alia). For example, the occurrence of ‘Goofy’ in the consequent of (3) appears to be bound by material in the antecedent (or perhaps by the conditional operator) and to range over various children named ‘Goofy’. Meanwhile, (4) seems to involve a donkey anaphoric proper name. In (3), the occurrence of ‘Gerontius’ does not refer to any one individual but instead seems to be anaphoric on the non c-commanding indefinite (‘a lover called “Gerontius”’) and to range over different men called ‘Gerontius’ (Elbourne 2005, 181).¹¹⁸

¹¹⁸Other modified occurrences of proper names include proper names introduced as surrogates for definite descriptions. For example, Burge (1973) and Dever (1991) argue that proper names can be used to refer to the satisfier of an antecedent definite description when the speaker is not causally related to the named object.

(a) The shortest spy in the 21st century will be Caucasian. Call him ‘Bertrand’. Bertrand will also be bald.

(b) Someone cast the first stone. Whoever he was, call him ‘Alfred’. Alfred was a hypocrite. (Burge 1973, 436)

(3) If a child is christened “Goofy”, and the CEO of Disney hears about it, he’ll sue Goofy’s parents. (Geurts 1997, 322)

(4) Every woman who has a husband called ‘John’ and a lover called ‘Gerontius’ takes only Gerontius to the Rare Names Convention. (Elbourne 2005, 181)

If the occurrences of ‘Gerontius’ and ‘Goofy’ in the embedded clauses of (3) and (4) are occurrences of proper names, then it would appear that the references of proper names *can* be bound and shifted by operators and that proper names do not – or do not always – function as simple referring expressions.¹¹⁹

As Cumming (2008) observes, these cases are problematic not only for standard referentialism but also for canonical versions of descriptivism.¹²⁰ Both referentialists and descriptivists subscribe to what Cumming describes as ‘functionalist’ views of the semantics of proper names, where proper names determine (perhaps partial) functions from worlds to entities. For the descriptivist, this

These cases provide less straightforward evidence for anaphoric theories of proper names. For example, one might object that the proper names in (a) and (b) are *referential*. Burge acknowledges this objection, but maintains that the names *need not* be taken to be referential – and perhaps, in certain cases, cannot be. For example, if there is no shortest spy in the 21st century (e.g. because two men of equal stature compete for the distinction), then the token of ‘Bertrand’ cannot be interpreted referentially, according to Burge. (Of course, another response is that ‘Bertrand’ simply fails to refer in such a case, since there is no unique satisfier of the reference-fixing description.)

Burge concludes that the referentialist must supply a different semantics for these non-referential occurrences of proper names, and insofar as they must do so, their position is weakened. Appeal to special uses where proper names do not play the role of individual constants, according to Burge, is ‘flimsy and theoretically deficient’, and the referentialist is faced with “the task of justifying the disunification” (1973, 437).

¹¹⁹ There are a variety of ways in which standard referentialist accounts might accommodate these cases. For example, the referentialist might maintain that the bound reading of (3) is not *semantically* available, but is accommodated by taking the used name in the embedded clause to be elliptical for something like ‘the child named ‘Goofy’’, just as the subordinated reading of (a) is attained by taking ‘leg’ to mean something like ‘appendage called a ‘leg’’:

(a) If you call a ‘tail’ a leg, how many legs has a dog?

(The answer to the riddle is ‘four’, since the last occurrence of the name is used rather than mentioned.) The bound reading of (3) is perhaps coerced because of a tension between the demands of the quantifier, which wants to quantify over a group of individuals and the referential semantics of the proper name. For an alternative account, also compatible with referentialism, see section §5.4.

¹²⁰ Cumming’s claim that these cases are equally problematic for descriptivist accounts is too strong. Some versions of descriptivism are better equipped to handle these cases than others. For example, according to metalinguistic descriptivism (Bach 1987, Burge 1973, Elbourne 2005), the proper name ‘Goofy’ is proxy for a description like *the individual named ‘Goofy’*. Since there is no unique individual named ‘Goofy’, the uniqueness condition associated with the definite description must be satisfied by, for example, evaluating the description relative to situations containing a unique bearer of the name, or associating the name with a free contextual variable or a domain restriction variable of some other kind. Proponents of the latter view might permit the variable associated with the name to be bound, while proponents of the former view might postulate that (3)-(4) involve quantification over situations each of which contains a unique satisfier of the metalinguistic description associated with the name.

function is a non-constant function from worlds to entities.¹²¹ However, the occurrences of ‘Goofy’ and ‘Gerontius’ in (5) and (6) do not single out determinate individuals at the world of report; there is no constant or nonconstant function which maps the occurrences of ‘Goofy’ and ‘Gerontius’ to a unique individual at the actual world. Instead, it seems appropriate to represent, for example, the contribution of the occurrence of ‘Goofy’ with a bound individual variable.

- (5) For every x , if (x is a child christened “Goofy” and the CEO hears that x is christened “Goofy”), then (the CEO sues x ’s parents).

Like a bound variable, the occurrence of ‘Goofy’ is seemingly able to range over a domain of individuals, rather than picking out a single, determinate individual.

Cases like (3) and (4), where proper names seem to interact with quantifiers and conditional operators, provide one motivation for anaphoric theories of proper names. As we will shortly see, Cumming and Fine argue that proper names interact with operators in other ways. According to Cumming, for example, proper names can occur as existentially bound variables in ‘name introducing constructions’. In addition, both Cumming and Fine claim that *attitude verbs* like ‘believe’ operate on proper names, binding the argument positions that they occupy.

5.1.2 Motivating anaphoric theories: a novel approach to substitution failure?

As well as providing a natural account of bound or anaphoric occurrences of names, proponents of anaphoric theories maintain that these views provide a solution to familiar problems relating to *substitution failure*. It is often observed that simple sentences that differ by substitution of co-referent proper names like those in (6) can convey different information (and perhaps express different propositions), while belief report sentences like those in (7) may elicit different truth-value judgments in appropriate contexts of report.

(6a) Superman is Superman.

(6b) Superman is Clark Kent.

¹²¹ This is also true of Russellian descriptivism, as Cumming (2008) notes, since a (proper) Russellian description has a unique witness at certain worlds, including the actual one.

(7a) Lois believes that Superman is Superman.

(7b) Lois believes that Superman is Clark Kent.

It is difficult to see how the sentence pairs can differ in these ways if the semantic value of a proper name is exhausted by its reference, so that two names that name the same thing have the same semantic value.

The approach that anaphoric theories take to substitution failure is a natural outgrowth of two familiar and independently plausible ideas. The first is that proper names derive their references anaphorically and are thus more similar to variables than either individual constants or definite descriptions. The second is that sentences containing co-designative terms can semantically differ from one another in virtue of structural differences, such as those that arise from differences in anaphoric relations between terms. For example, authors such as Soames (1989c, 1994) and Salmon (1986, 2010) argue that the differences in the informational values of pairs of sentences like those in (8) result from structural or potential structural differences in the sentences. In particular, the pronoun in (8a) must be bound by the antecedent proper name (or an operator introduced by its movement), while the pronoun in (8b) cannot be bound and must be interpreted referentially. The binding of the object pronoun in (8a) is said to produce a sentence with a different logical structure and a different set of truth-conditions.¹²²

(8a) Superman admires himself.

(8b) Superman admires him. (referent of 'him'= Superman).

As Evans (1980) and Fine (2007) note, appealing to conventional, *asymmetrical* anaphoric relations like those between pronouns and their antecedents will not explain the difference that arise in connection with sentence pairs like (6) and (7), since the proper names in (6)-(7) seem symmetrically related to one another. The strategy taken by the anaphoric theorist is to distinguish the pairs by appealing to

¹²² Soames (1989, 1994) assigns sentences (8a) and (8b) the logical forms in (8a') and (8b') respectively, which are associated with the propositions (8a'') and (8b'').

(8a') $\lambda x[x \text{ admires } x]$ (Superman)

(8a'') $\langle \text{Superman}, \textit{self-admiring} \rangle$

(8b') $\lambda x [x \text{ admires Superman}]$ (Superman)

(8b''). $\langle \text{Superman}, \textit{admires Superman} \rangle$

unconventional, symmetric anaphoric relations between proper name tokens. On the one hand, it is a familiar idea that proper names are – in a sense – *anaphors*. According to Føllesdal, this view is implicit in the conception of proper names as rigid designators. The rigidity of a proper name is secured by the fact that its reference is fixed (once and for all across circumstances of evaluation) by its relation to an actual name-using practice. A speaker uses a term rigidly if her primary intention is to refer to whatever the term actually refers to – to whatever is referred to by other tokens belonging to the same actual-worldly name use. Proper names are in this respect like pronouns or quantificational variables in that a speaker’s primary intention in using a proper name is to “keep on referring to the same object”:

When we use a name, a pronoun or a quantificational variable, we signal that we intend to keep on referring to the same object, and we commit ourselves to do our best to keep track of it... Constancy of reference is therefore not something which is guaranteed, but something we must strive for when we use singular terms. (Føllesdal 2004, xxviii-xxix)

The anaphoric aspect of the way that the reference of a name is determined is particularly clear on causal chain theories, where the use of a name involves an intention on the part of the speaker that her token co-refer with other tokens she has causally come into contact with (Chastain 1975, Kripke 1972, see also Donnellan 1972 and Sommers 1982). The usual view, however, is that theories of how the references of proper names are secured, like the causal theory, do not have anything to do with the *semantics* of proper names.

A theory of how names acquire, retain, and in some cases change, their semantic properties over time. ... it is not a theory of the same sort as one that interprets descriptive anaphora -- like the pronoun *she* in the discourse: *Some woman will be the forty-fifth president of the United States. She will be a Republican.* The task of such a theory is to specify the semantic contents and truth conditions of such discourses, not to explain the causal history by which the words in it acquired their semantic properties. (Soames 2006, 668)

According to Kaplan (1989a), for example, the causal chain theory belongs to an account of the *meta-semantic* facts concerning proper names.

Those who believe that the semantic function of a name is completely exhausted by the fact that it *has* a particular referent will regard the historical chain theory as a part of metasemantics. In general, if a referent is all the meaning a name has, then any information used to *fix* the referent is metasemantical. (574)

Proponents of *anaphoric* theories of proper names call this traditional view into question. On these views, anaphoric relations between proper name tokens *are* semantically significant relations, and

sentences like (6) and (7) that differ by substitution of co-referential proper names can be distinguished by adverting to differences in these relations.

In the following section, I examine Cumming’s (2007, 2008) version of the anaphoric theory of proper names, before turning in §5.3 to Fine’s proposal.

5.2 Variabilism

5.2.1 The Variabilist Proposal

Cumming’s Variabilism builds on a small tradition that associates proper names with bindable individual variables.¹²³ An early example of a view in this tradition is Burge’s (1973) *predicative theory* of proper names. According to Burge, proper names have the semantic contents and syntactic structures of complex demonstratives, where the demonstrative component is analyzed as an individual variable that either receives a contextually determined assignment of value or is bound.

Like Burge, Cumming maintains that proper names introduce variables into the logical forms of sentences. A sentence like (9), for example,

(9) Aristotle laughs.

... corresponds to an open sentence, which denotes the open proposition in (10) (a function from variable assignments to closed propositions).

(10) $[[\text{laughs } x_1]]^{w, g[x_1 \mapsto \text{Aristotle}]} = \text{true}$ iff

$g[x_1 \mapsto \text{Aristotle}](x_1) \in_{I, M} (\text{'laughs'})^w$ iff

$\text{Aristotle} \in_{I, M} (\text{'laughs'})^w$.¹²⁴

According to Cumming, the variables introduced by proper names in sentences like (9), where names do *not* have bound occurrences, receive assignments of value in the way that free pronouns do. The

¹²³ There are a variety of views that arguably deserve to be included in the category of anaphoric theories of proper names. The dynamic semantic literature contains a variety of examples, including Geurts (1997), Swanson (2006), Maier (2009) and Roberts (2009). One prominent view of the semantics of proper names in the philosophical literature is Brandom (1994). On Brandom’s view, proper names have senses determined by the causal-historical chains that they are associated with. Another example is Sommer (1982), who claims that a baptism introduces “a special duty pronoun” with a stable character (i.e. constant reference) (230).

¹²⁴ In (10), the truth-value of the open expression depends on both a variable assignment for the reference of ‘x’ and a world for the extension of ‘laughs’. (I is the interpretation function for the model, M.)

variable ‘ x_1 ’, representing the name ‘Aristotle’ in (9), is mapped to a value by a contextual assignment function, which is enriched to include assignments of value to the free variables corresponding to proper names. In (10), the contextual variable assignment (denoted ‘ g ’) maps the variable ‘ x_1 ’ to Aristotle.¹²⁵ The open proposition denoted by (9), represented in (10), is true at the world w and assignment g iff Aristotle laughs at w .

It is important here to head off a potential source of confusion about Cumming’s view. Although proper names are assigned values by a contextual assignment function, Cumming maintains, with Kaplan, that proper names are *not* context-sensitive – the contextual assignment function assigns the *same* value to the variable introduced by the proper name in every context.¹²⁶ However, Cumming rejects Kaplan’s conclusion that proper names therefore are not (or that there is no point in treating them as) dependent on a contextual assignment of value. According to Cumming, proper names must receive their values from a contextual assignment function because there are operators capable of shifting the coordinates of the assignment function in the parameters that supply proper names with their values.

The contextual assignment function also does not *disambiguate* homophonous proper names e.g. the name ‘Aristotle’, which refers to the philosopher, from the name ‘Aristotle’, which refers to the shipping magnate. According to Cumming, name tokens belonging to different name uses supply different variables to the semantic representation. For example, all tokens of ‘Aristotle’ associated with the *same* use as the token in (10) deliver the *same* variable ‘ x ’ to the semantic representation, while tokens of ‘Aristotle’ that belong to *different* uses deliver different variables (e.g. ‘ y ’ rather than ‘ x ’; I will use alphabetic variants to indicate variables picking out different name types or uses and subscripts to indicate token occurrences of name types/uses. The assignment function then maps

¹²⁵ ... this is what ‘ $g[x_1 \rightarrow \text{Aristotle}]$ ’ says. Lines two and three of (10) say that $[[\text{laughs } x_1]]$ is true relative to the assignment function g that maps x_1 to Aristotle and the world of report w iff $g(x_1)$ (the value of ‘ x_1 ’ relative to g) is in the denotation of ‘laughs’ at w . Since $g(x_1) = \text{Aristotle}$, (9) is true at w iff Aristotle laughs at w .

¹²⁶Accordingly, Cumming’s assignment function differs from a standard Kaplanian assignment function in containing parameters corresponding to assignments of value to context-*insensitive* expressions.

As we will see, Cumming’s assignment functions depart from Kaplan’s in another way. According to Cumming, the parameters of the contextual assignment function corresponding to the values of proper names are *shiftable*. Recall that Kaplan maintains that there are no operators that operate on parameters of context.

variables corresponding to “individuated uses” of proper names to their referents (2008, 556). For example, when the assignment function g maps the variable ‘ x_1 ’ contributed by ‘Aristotle’ in (9) to a value, it is mapping an already disambiguated proper name (either the name that refers to the philosopher, or to the shipping magnate, or...) to a referent.

According to Cumming, a proper name is disambiguated when it is assigned to a ‘discourse referent’ (or ‘dref’). Here we must introduce a small amount of background: Cumming’s Variabilism is situated in *discourse representation theory*, a version of dynamic semantics addressed (as it is presented in Kamp 1981) to the problem of cross-sentential anaphora. The central idea of discourse representation theory is that the interpretation of natural language discourse takes place in the context of a representation structure (van Eijck 2006, 253). Processing a piece of discourse (some sentence or sequence of sentences) in a particular representation structure produces a new, ‘updated’ representation structure. *Discourse referents*, according to Cumming, are variables, like the variable ‘ x_1 ’ in (10), that are used to represent the objects or individuals that the discourse is about. Certain expressions, such as indefinites, serve to introduce discourse referents (new variables), while other types of expressions, such as anaphoric pronouns and definite descriptions, are associated with ‘familiar’ discourse referents (ones that have already been introduced). According to Cumming, proper names are like pronouns and definite descriptions and unlike indefinites in that they are associated with *familiar* discourse referents.

The discourse referent associated with a name token is an additional kind of semantic value, according to Cumming – the name’s *denotation*, as opposed to its reference. Where the referents of names are, as on the familiar view, simply entities or groups of entities (the individual, Aristotle; the planet, Venus; the team, Manchester United, etc.), the denotations of names are discourse referents representing individuated name uses.¹²⁷

How, precisely, are names individuated – when, that is, do a pair of name tokens denote the

¹²⁷ Names belonging to the same name use are assigned the same discourse referent, represented by a particular variable, while names belonging to different names uses are assigned different discourse referents, represented by different variables

same dref? According to Cumming, a pair of name tokens n and n' denote the same dref (are 'denotationally isomorphic', in Cumming's terminology) iff n and n' connect to some segment of the same anaphoric 'tree', terminating in the same initial baptism. Since name tokens that connect to segments of the same anaphoric tree co-refer, denotational isomorphism entails referential isomorphism (i.e. co-reference). However, since co-referent names can be introduced by way of different baptisms, the converse direction of implication does not hold: name tokens can be referentially isomorphic (co-refer) without being denotationally isomorphic. For example, tokens of 'Hesperus' and 'Phosphorus', which co-refer to the planet Venus, will *not* denote the same discourse referent, since they do not connect to segments of same anaphoric tree.

Cumming's assignment function takes an already disambiguated proper name – one that has been assigned to a dref represented by a particular variable – and maps it to an ordinary referent. However, since discourse reference uniquely determines reference, the assignment of reference is the same in every context. One might then reasonably ask what *work* the contextual assignment function is doing.

As Cumming himself notes, his proposal invites two worries. The first is that variabilism is just a "fancy version of the individual constants view", one where the allocation of reference to a name takes a (seemingly unnecessary) detour through an extra piece of semantic machinery, a contextual assignment (Cumming 2008, 527). The second worry is that this detour obscures a fundamental feature of proper names. According to Kaplan (1989a, 598), the semantics assigned to proper names should reflect the fact that names are not context-sensitive by having proper names receive their reference from the interpretation function of the model rather than the assignment function. If proper names and context-sensitive expressions are allocated reference by the same mechanism, then this difference between names and context-sensitive expressions like pronouns is obscured.¹²⁸

¹²⁸ There is a third worry, in a way more fundamental than the first two, concerning the claim that the discourse referent associated with a proper name constitutes an additional kind or level of *semantic* value. A token is a token of a particular semantic type of proper name just in case it belongs to some name use, represented by a discourse referent. However, the fact that a token of 'Aristotle' is associated with a certain discourse referent – and thus that it is a token of a certain semantic type of proper name, rather than a meaningless string or a token

Cumming argues that his appeal to assignment functions is “motivated by sound empirical reasons” (2008, 541). According to Cumming, the denotations of proper names are not immured in the model, like those of individual constants, and can be manipulated by operators that bind and shift the parameters of the variable assignment function in the coordinates that supply names with their values.¹²⁹ One of Cumming’s main examples of names interacting with operators involves a class of ‘name-introducing constructions’ identified in Sommer (1982), and exemplified by the indefinites “a gentleman named ‘Ernest’” and “a lover called ‘Gerontius’” in (11) and (12) below.

(11) There is a gentleman in Hertfordshire by the name of “Ernest”. Ernest is engaged to two women. (Sommer 1982)

(12) Tampa was home to a serial killer named ‘Bobby Joe Long’. Long was known as ‘the Classified-Ad Rapist’. (Geurts 1997)

Cumming maintains, with Sommer, that name-introducing constructions like these (along with others formed with cleft constructions and wh-clauses) are used to satisfy an *introduction* or *familiarity requirement* on proper names: names not already familiar to discourse participants must be *introduced* before they can be used.¹³⁰

of an expression of some other semantic type – would seem to be a canonical example of a *pre-semantic* fact. The assignment of a discourse referent disambiguates a token of ‘Aristotle’ in the same way that an assignment of semantic type to a token of ‘bank’ disambiguates that token. If the discourse referent assigned to a proper name is part of its semantic value, then the boundary between semantic and pre-semantic facts becomes extremely unclear. This worry will crop up again in section §5.4.

¹²⁹ Cumming does not permit the references of names to be shifted by *modal* operators – only those operators that are capable of manipulating the contextual assignment function. Once a denotation has been assigned to a name, its reference (unlike the reference of a description) will remain constant across circumstances of evaluation when the propositions expressed by sentences containing the name are evaluated for truth or falsity at different possible worlds. As a consequence, Cumming maintains, his account predicts the core modal data concerning the unshiftability of names under metaphysical modal operators that referentialists take to support their position, while also capturing the fact that names shift under attitude verbs and other (on Cumming’s view) non-metaphysical (epistemic, doxastic, etc.) modal operators.

¹³⁰ Names *can*, according to Cumming, appear ‘discourse-initially’ (without an explicit antecedent e.g. in the form of an indefinite noun phrase) – but only so long as the name is already familiar to the participants in the discourse e.g. if the discourse concerns a well-known figure or a mutual friend known to each conversational participant as ‘Ernest’. The behavior of proper names in this regard is somewhat anomalous, since other definite noun phrases typically *do* require explicit antecedents. Cumming proposes that these ‘discourse-initial’ occurrences of proper names, which are felicitous in the absence of an introducing indefinite, are felicitous because the discourse referent was *already* familiar at the beginning of the discourse, having been introduced in earlier discourse contexts. (The various participants in the discourse need not have had the same introduction.) Names are not *entirely* unique in this respect. Cumming notes that similar discourse-crossing anaphoric dependencies occur with more familiar devices of anaphoric reference, such as pronouns. A conversation

Following Sommer, Cumming proposes that the proper names in examples like (11) and (12) occur as *anaphors*, and that their antecedents are the indefinite ‘name-introducing’ constructions, which are analyzed as existential quantifiers. For example, the indefinite ‘a gentleman called ‘Ernest’ in the first sentence of (11) introduces existential quantification that binds the variable corresponding to the name ‘Ernest’ that occurs in the second, open sentence.

(11') $\exists xyz$ (gentleman $x \wedge$ in-Hertfordshire $x \wedge$ named-‘Ernest’ $x \wedge$ woman $y \wedge$ woman $z \wedge y \neq z \wedge$ engaged $xy \wedge$ engaged xz) (Cumming 2008, 536)

Notice that the indefinite qua existential quantifier is permitted to take (semantic) scope across the sentence boundary. According to Cumming, anaphoric relations between names and their antecedents extend beyond the c-command domain – crossing sentence (in examples (11) and (12) above) and even discourse boundaries. The antecedents of proper names are *dynamic* binders.

Examples like (11) and (12), on their own, provide a rather thin empirical basis for Variabilism. If proper names have an assignment-dependent semantics, and name-introducing constructions are operators on reference assignments to proper names, we would expect to find examples of other operators that operate on the coordinates names depend on.

According to Cumming, other operators *do* operate as ‘assignment shifters’ – attitude verbs in particular. Proper names are said to display an ambiguity akin to the de dicto/de re ambiguity with respect to attitude verbs like ‘believe’, where a name is said to be interpreted ‘de dicto*’¹³¹ when it appears within the semantic scope of an attitude verb that binds the parameter of the assignment function in the coordinate that supplies the name with its value. Cumming supplies the following example, after *Love’s Labours Lost*.

Context: Rosaline, Maria and Katherine are going to a masked ball. They exchange favors given to them by their suitors to mislead them about their identities. The exchange is

between two workmates over lunch one day in which one of them mentions a new love interest can be resumed the next day with the other one asking, ‘So, did he call?’ (adverting to the love interest) (2007, 17). A natural way to understand such cases, according to Cumming, is to treat the pronoun at the start of the second discourse as anaphoric to the indefinite in the first discourse. This view requires, however, that anaphoric chains sometimes cross discourse boundaries, as Cumming claims that those associated with proper names do.

¹³¹ Cumming employs the ‘de dicto*’ notation to distinguish the de dicto reading of names from the de dicto reading of descriptions, in case their analyses should differ.

conducted as follows:
 Rosaline \Rightarrow Katherine
 Katherine \Rightarrow Maria
 Maria \Rightarrow Rosaline

Rosaline's suitor is Biron, and Rosaline gives her favor to Katherine. Consequently, Biron mistakes Katherine for Rosaline. In this scenario, Cumming claims, (13) has a true reading.

(13) Biron thinks Katherine (de re) is Rosaline (de dicto*).

According to Cumming, the true reading of (13) arises out of a de dicto* interpretation of the proper name 'Rosaline'.

Cumming follows the lead of theorists who argue that 'believe' and other attitude verbs denote relations between individuals and something more fine-grained than a set of worlds – in this case, the open proposition expressed by the subordinate clause, which we may regard as a set of world-assignment function pairs. Biron stands in the belief relation to this open proposition, according to Cumming, iff it is "true at the world as Biron conceives of it and the reference function as Biron takes it to be" (2008, 545).

(13') $[[\text{Biron thinks that Katherine is Rosaline}]]^{c,w,g}=1$ iff

$\exists x: g(x) = g(\mathbf{Katherine}) \wedge \forall \langle w', g' \rangle \in \text{Do}_{x,w,b}: g'(x) = g'(\mathbf{Rosaline})$ in w' .

The open proposition will be true at the world as Biron conceives of it and the reference function as he takes it to be iff, at every assignment-world pair $\langle w', g' \rangle$ compatible with what Biron believes at the context c and world w of report, the assignment function, g' , maps the discourse referent corresponding to the name 'Rosaline' (in bold) to the reference of the discourse referent corresponding to the Katherine at w' (strictly, to the referent of the discourse referent corresponding to 'Katherine' at w'). Informally, (13) is true on the de dicto reading just in case every world compatible with what Biron believes is a world where *Katherine* is the referent of the name 'Rosaline'.

5.2.2 Problems for Variabilism

I now turn to evaluating Cumming's proposal, beginning with his account of the truth-conditions of belief reports like the one in (13).

According to Cumming, (13) has a true reading, which he proposes to explain by adverting to quantification over reference functions: (13) is true iff all the worlds compatible with what Biron believes are worlds where the reference function assigns Katherine as the reference of ‘Rosaline’. The truth of (13) is thus said to depend on Biron’s beliefs concerning the referent of the proper name ‘Rosaline’ (the individual that the reference function assigns as its value).

The immediate difficulty with Cumming’s proposal is that the truth or falsity of (13) does not, intuitively, depend in any essential way on Biron’s beliefs concerning the reference of the name ‘Rosaline’. Suppose that Rosaline has not only exchanged favors with Katherine but has concealed her name from Biron, supplying him with the false name, ‘Evaline’, in hopes of further deflecting his attentions. Even if the speaker and the audience are aware of the deception – of the fact that the name ‘Rosaline’ is not a name that Biron has of Rosaline – (13) is still acceptable (true or correct¹³²) as a *de dicto** report. The truth or correctness conditions of (13) do not – or, at any rate, *need not* even in part concern Biron’s beliefs about the reference of ‘Rosaline’.

What then *does* the truth or correctness of (13) require? One plausible view is that it (13) is true or correct iff Biron believes that Katherine is the bearer of a certain set of properties – the properties that Biron associates with *Rosaline*. These may or may not include the property *being the referent of ‘Rosaline’*, and may – in addition or instead – include properties like *being the beloved of Biron*, *being the sharp-tongued lady of the princess*, *being wooed by Biron in the king’s park*, etc. There are a variety of semantic and non-semantic means by which such a reading might be generated e.g. by type-shifting the proper name ‘Rosaline’ in such a way that it comes to denote a set of her properties,¹³³ by assigning the

¹³² A word about *truth* vs. *correctness* conditions: some authors have wanted to distinguish between the truth and correctness of sentences in such a way that a report can be true but incorrect or unassertable because of pragmatic (or, more generally, *extra-semantic*) features of the report. For example, some theorists may want to maintain (*pace* Cumming), that (13) is strictly and literally false on the grounds that Biron does not believe the impossible proposition *that Katherine is Rosaline*, and that the true reading of the report arises e.g. via a pragmatic inference from the fact that Biron does not believe the impossible proposition to the conclusion that the speaker intends to convey that Biron believes that Katherine has certain of Rosaline’s properties, etc. For that matter, some may wish to deny that (13) is either true *or* correct. The important point, for present purposes, is that these judgments do not seem to track Biron’s beliefs concerning the reference of the name ‘Rosaline’.

¹³³ Note, however, that an ordinary type shift of the kind familiar from Partee (1986) will not bring it about that names like ‘Rosaline’ denote sets of properties like the ones listed above. The type shift simply ‘lifts’ the type of a name so that it denotes the property of being identical to the usual referent (e.g. *being identical to Rosaline*).

proper name the semantics of a description, or by some sort of pragmatic inference from the fact (if it is one) that Biron cannot truthfully be said to believe that Katherine and Rosaline are identical. However, permitting attitude verbs to take scope over and bind proper names in the coordinates that (allegedly) supply proper names with their values does *not* appear to be one of the ways in which the reading is generated.

It is important to notice that this problem with Cumming's analysis of (13) generalizes to other applications of his semantics to belief report puzzles. Cumming motivates his Variabilist semantics in (large) part on the grounds that it distinguishes pairs of reports like the ones in (14).

(14a) Lois believes that Clark Kent is brave.

(14b) Lois believes that Superman is brave.

Where 'x₁' and 'x₂' are variables representing the discourse referents associated, respectively, with the names 'Clark Kent' and 'Superman', (14a) is said to be true if and only if Lois stands in the belief relation to the open proposition denoted by 'brave x₁', while (14b) is true if and only if Lois stands in the relation of belief to the open proposition denoted by 'brave x₂'. Since the two open propositions are distinct (involve different discourse referents), Cumming maintains that it is possible to stand in the belief relation to one but not the other open proposition.

Once again, the truth-values of the reports are predicted to depend on whether the open propositions denoted by the subordinate clauses are true at the world as the subject conceives of it and the reference function as she takes it to be. For example, the report in (14a) is predicted to be false since Lois believes that *the referent of 'Clark Kent'* (on the de dicto reading) is brave, while the report in (14b) will be true since Lois does not believe that *the referent of 'Superman'* (de dicto) is brave. As before, however, the truth-conditions of the reports do not seem to depend in any essential way on the subject's – here, Lois' – beliefs concerning the referents of the names. For example, (14a) may be false or incorrect if Lois lacks a use of the name of 'Clark Kent' and merely believes that *that guy in the reporter's hat* is not brave. Likewise, (14b) might be true or correct if Lois lacks a use of the name 'Superman' and merely believes that *that guy leaping tall buildings is brave*. Here the reports differ in truth

or correctness – but not in ways that Variabilism can capture.

Unfortunately, the case for Variabilism cannot rest solely on name-introducing constructions either (e.g. ‘a gentleman named ‘Ernest’’). The evidence these constructions supply for Cumming’s assignment-dependent semantics is far too *weak*. For one thing, it is not clear how much of a ‘requirement’ the name-introducing requirement really is. As Chastain (1975, 217) notes, “the simplest way to introduce a proper name into discourse is just to start using it”. Nor is it clear that the requirement, if it is properly regarded as such, is *semantic*. If I know that you are not familiar with a name that I am disposed to use, *etiquette*, perhaps, demands that I preface my use of the name by some qualifier: “I’m having dinner with *my friend* Jill tonight”, rather than “I am having dinner with Jill tonight”. Indeed, since the name-introducing construction need not give the hearer any very useful information (“So, there’s this guy ‘Arvid’...”), one hypothesis is that function of a name-introducing construction is simply to flag (perhaps pre-semantically) that a token occurs *as* a token of a name. Where it is clear that a token occurs as a token of a name, the introduction may be dispensable. For example, an utterance of “... There’s this group of guys sitting in the bar, and Charles is betting Dave that Arsenal...” is acceptable even though there is no *specific* introduction of a name at all.

One defensive line on behalf of Cumming is that – since proper names depend for their values on the *contextual* assignment function – it is inappropriate to expect (as Cumming does) that the values of proper names *will* be shiftable by operators. Cumming treats names on a par with indexicals (they are a sort of ‘constant’ indexical on his view) insofar as he allocates reference to names by the mechanism Kaplan proposes for allocating reference to indexicals. However, as we saw in Chapters 2 and 3, some parameters of the contextual assignment function – those that allocate reference to pure (1st and 2nd person) indexicals – cannot be shifted. Perhaps proper names are like pure indexicals, then, in that they depend on unshiftable parameters?

The problem with this line of response is that it is pre-theoretically clear, independent of ‘narrow scope’ evidence for the parameter-dependence of pure indexicals (independent, for example,

of evidence that operators operate on characters), that pure indexicals have some intermediate level of content (semantic or not) which it is worthwhile modeling as a function of context. However, since proper names are not context-dependent in the sense that their references vary depending on the context of use, there seems to be no point in taking them to be ‘parametric’ if there are no operators that shift their references.

A different way Cumming attempts to motivate his Variabilist semantics is by arguing that semantic content must be identified with discourse content in order to sustain a particular view of the relation between *semantic content* and *comprehension*. According to what Cumming calls the ‘truth-conditionalist’ account of this relation, grasping the content of a token sentence S is a matter of grasping a proposition p with the same possible worlds truth-conditions as the proposition p semantically expressed by S . This criterion is inadequate for familiar reasons e.g. it fails to distinguish between necessary propositions, and thus makes grasping any necessary proposition (*that* $1+1=2$, *Venus is identical with itself*) sufficient for grasping the content of e.g. the Reimann hypothesis. The finer-grained ‘referentialist’ account, which requires grasp of a structured proposition consisting of the same objects, properties and relations in the same manner of combination, etc., fares little better, according to Cumming, since it does not distinguish pairs like (6a) and (6b) (repeated below):

(6a) Superman is Superman.

(6b) Superman is Clark Kent.

Of course, some referentialists opt to maintain that grasping the content of (6a) *is* sufficient for grasping the content of (6b). According to Cumming, this response is inadequate, since it leaves the referentialist with a notion of content that is *too coarse-grained to figure in an account of communication*. Here Cumming appeals to an example due to Loar (1976).

Suppose that Smith and Jones are unaware that a certain man being interviewed on television is someone they see on the train every morning. They have just been talking about the man on the train, when Jones says,

(15) He is a stockbroker.

Jones intends to refer to the man on television, but Smith misconstrues Jones’s referential intentions, taking Jones to be referring to the man on the train.

Smith has correctly identified Jones's referent, since the man on television is the man on the train, but he has failed, according to Loar, to understand what Jones has said. According to Cumming and Loar, the example shows that grasp of a proposition with the same structured singular content as the proposition that the speaker intends to convey is in some cases *insufficient* for understanding what the speaker has said.

If an utterance encodes a certain content, then it is natural to treat interpretation as decoding the utterance and recovering its content. But if content is individuated as the referentialist takes it to be, then insofar as Smith has *not* understood what Jones has said, there must be more to the content of Jones' utterance than simply the proposition expressed. (Loar 1976, 356)

On the view of the relation between semantic content and comprehension that Loar appeals to, an interpreter has understood an utterance just in case the interpreter assigns the correct semantic content to it. Since, according to Loar, Smith has misunderstood what Jones has said even though he has correctly identified the referent of the singular term, and grasped the property predicated of the referent, the semantic content of Jones' utterance must not be identical to its 'referential' content. In addition to grasping the referential content of Jones' utterance, Loar argues, Smith must grasp something of how the referent of the pronoun is presented to Jones: "some 'manner of presentation' of the referent is, even on referential uses [of a term], essential to what is being communicated" (1976, 357).

If information about how the reference of Jones' token of 'he' is established is semantically significant information – part of the content that must be grasped by an interpreter in order for the interpreter to have understood what the speaker has said, then (if the straightforward account of the relation between semantic content and comprehension is to be maintained) a complete account of the semantic content of Jones' utterance will encode this additional information in some way.

According to Cumming, the information about how the reference of a proper name token is established is encoded in the discourse referent assigned to the name token. He claims that Loar's argument motivates the claim that:

[R]eferential isomorphism is not strong enough to characterize all and only cases of successful communication. As a corollary to this, Russellian propositions are too course-grained to serve

as the distinguished contents of communicative acts. (2007, 50)

Instead, *discourse contents* are said to be the right grain “to serve as the distinguished contents of communicative acts”: Understanding what is said by an utterance of a sentence token is a matter of grasping a *denotationally isomorphic* proposition “consisting of the syntactic analysis of the sentence token decorated with the denotation (rather than the reference) of each node (a ‘discourse proposition’)” (2007, 51, 54). According to Cumming, this criterion of sameness of denotation succeeds where the criterion of sameness of reference and sameness of truth-conditions fail: It predicts that Smith has failed to grasp what Jones has said. Smith has failed to understand what Jones has said because Smith assigns the wrong discourse content to Smith’s token – he represents Smith’s token of ‘he’ by means, for example, of the variable (dref) associated with the use of the name ‘O’Leary’ for the man on the train, rather than a new dref originated by Smith’s demonstration of the man on TV.

The criterion of sameness of denotation is also said to predict that grasp of the content of (6a) is not sufficient for grasp of the content of (6b) – and is said therefore to explain why it is possible for a rational, semantically competent speaker like Lois to assent to an utterance of one but not the other sentence:

(6a) Clark Kent is Clark Kent.

(6b) Clark Kent is Superman.

Since the tokens of ‘Clark Kent’ in (6a) are part of the same name use, tracing back to the same initial baptism, they denote the same dref. By contrast, while the tokens of ‘Clark Kent’ and ‘Superman’ in (6b) co-refer, they belong to different name uses and denote *different* drefs. Since the name tokens in (6a) denote the same dref, grasping what is said by (6a) requires recognizing that the tokens co-refer (since discourse reference determines reference).¹³⁴ Grasping what is said by (6b) does *not* require recognizing that the tokens co-refer, however. Consequently, (6b) can supply a competent speaker with new information – information that she did not previously possess in virtue of her semantic

¹³⁴Strictly, in order for a competent speaker to know that the tokens in (6a) co-refer, the speaker must recognize not only that the tokens denote the same dref, but also that discourse reference determines reference, and thus that two names which co-designate co-refer – and be able to bring this knowledge to bear on (6a).

competence alone.

The immediate worry is that Cumming simply pushes the problem of informative identities back one step further. Surely competent speakers might fail to recognize that tokens like those in (6a) *denote the same dref* (when they do)?

The answer to this question depends on the account of discourse reference we adopt. According to Karttunen's (1976) conception of discourse reference, semantic competence requires that one recognize if a new dref is being introduced or a familiar dref accessed. Cumming ostensibly adopts Karttunen's conception; in particular, he maintains that if two expressions, like the two tokens of 'Clark Kent' in (6a), are associated with the same dref, then semantic competence will require that one recognize this fact (one is not, however, tasked with determining which expressions among those with different drefs share a referent). Informative occurrences of (6a) will thus involve competence failure – failure to understand the semantic content of the sentence.

The difficulty is that Cumming *also* maintains that name tokens denote the same discourse referent just in case the tokens belong to the same anaphoric tree. This pair of commitments – that drefs are individuated only as finely as anaphoric chains, and that tokens that denote the same dref transparently co-refer – do not sit happily with one another. The following variation on Loar's case illustrates the tension.

Jones and Smith have just been talking about the man on the train who they are acquainted with under the name 'O'Leary'. Just then, O'Leary comes on the television, introduced by the host of the programme as 'O'Leary'. Smith and Jones do not recognize the O'Leary on TV as the same 'O'Leary' from the train. This time, Jones says,

(16) O'Leary is a stockbroker ,
...intending to refer to the man on television. (As before) Smith misconstrues Jones's referential intentions, taking Jones to be referring to the man on the train.

As in Loar's original example, Smith has correctly identified Jones' referent – here, referring to him by the proper name 'O'Leary', rather than the pronoun 'he' in Loar's (15). Moreover, the intuitive status of the pair of cases is essentially the same: we want to say either that Smith has understood what Jones has said in *both* cases simply in virtue of correctly identifying Jones' referent or that "some 'manner of presentation' of the referent is... essential to what is being communicated" and Smith has

not understood what Jones has said in *either* case since he fails to grasp the manner in which O’Leary is presented (Loar 1976, 357). The difficulty here, however, is since the use of the name ‘O’Leary’ for the man on the train and the use of the name ‘O’Leary’ for the man on television *are part of the same name use* – belong to segments of the same anaphoric tree terminating in the same initial baptism – and thus denote the same dref. Since the proposition that Smith grasps is denotationally isomorphic to the proposition that Jones intends to convey, Cumming predicts that Smith has understood what Jones has said in uttering (16). Arguably, however, this is the wrong result. Certainly, it seems to be at odds with Cumming’s verdict regarding Loar’s original example: that because Jones took Smith to be referring to the man on the train with his token of ‘he’, Jones did not understand what Smith said.

Notice that Cumming’s account of Loar’s original case only succeeds if we assume that the case involves a demonstrative use of ‘he’ which introduces a *new* discourse referent, as opposed to an anaphor that receives its reference and denotation from an antecedent occurrence of the name ‘O’Leary’. (Since anaphoric chains extend beyond sentence and discourse boundaries, on Cumming’s view, there is no reason that we must interpret the pronoun referentially.) For example, if we suppose that Jones follows up his utterance of (16) with,

(17) ...and he works on Wall Street ,

...where the pronoun ‘he’ gets its denotation (a discourse referent) from the antecedent proper name token in (16), Cumming’s account predicts that Smith *has* understood what Jones has said – whether he takes Jones to be co-referring with some token of ‘O’Leary’ directed at the man on the train or the man on the TV. In both cases, the dref is the same, since the tokens belong to the same anaphoric chain, grounded in the same initial baptism.

Since treating Loar’s original case and the variant in (16) *differently* does not seem to be in the cards, Cumming must either maintain that denotational isomorphism *is* sufficient for comprehension and that Jones understood what Smith said by uttering (15) *and* (16), or that grasp of a denotationally isomorphic proposition is *not* sufficient for comprehension and Jones did not understand what Smith said in *either* case. The first option amounts to a retraction of the claim that these cases motivate

Variabilism (since Variabilism *cannot* account for the impression that some speakers have that Smith has not understood what Jones has said). The difficulty with the latter option is that it leaves us without an account of the basic substitution failure phenomenon. For example, we can no longer maintain that (6b) (“Superman is Clark Kent”) is informative while (6a) (“Superman is Superman”) is not because grasping the content of (6a) is sufficient for understanding that the name tokens co-refer.

One option for Cumming is to revise his condition on denotational isomorphism, replacing the criterion that name tokens are denotationally isomorphic iff they connect to some segment of the same anaphoric tree with some more demanding criterion – one on which proper names can be associated with different drefs even if they belong to the same causal chain. As we will see, Fine’s account imposes a more demanding criterion of this kind; proper names belonging to the same causal chain *can* fail to substitute for one another since they need not be anaphorically related to one another in the sense relevant to substitution failure puzzles. As a consequence, Fine’s account avoids some of the objections I have raised for Cumming’s proposal – while remaining vulnerable to others.

5.3 Semantic Relationism

5.3.1 The Semantic Relationist Proposal

Unlike Cumming, Fine does not focus on the anaphoric dependencies between proper names familiar from causal chain theories of reference. Fine instead appeals to relations that obtain between a pair of name tokens when they are *semantically required to co-refer*.

Alongside intrinsic semantic facts like the fact that tokens of ‘Superman’ like the ones in (6a) refer to Superman, Fine argues, there are *irreducibly relational* semantic facts. These might include the relational semantic fact that the pair of tokens in (6a) co-refer with one another.¹³⁵

¹³⁵ Similarly, according to Fine, it can be a relational semantic requirement that pairs of common nouns co-designate. Fine gives the example that tokens of ‘bachelor’ and ‘unmarried man’ are semantically required to co-designate (2007, 43). This is presumably because ‘Bachelor = unmarried man’ has something of the status of a definition or meaning postulate (Carnap 1947), where a speaker cannot be said to be semantically competent with ‘bachelor’ without knowing (or being in a position to know) that it refers to unmarried men.

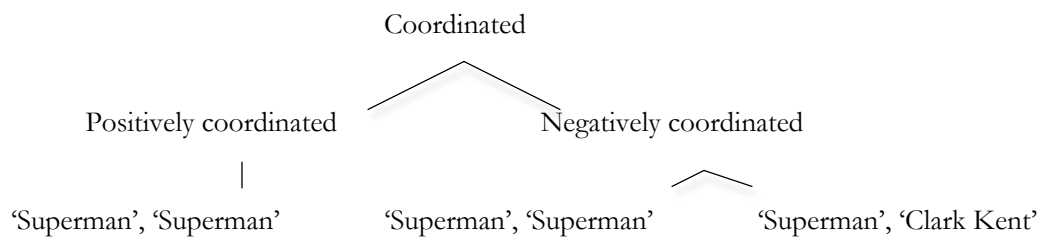
(6a) Superman is Superman.

(6b) Superman is Clark Kent.

When name tokens are semantically required to co-refer, their references are said to be ‘coordinated’. Coordination relations between the references of proper names can be negative or positive, where the references of a pair of tokens are *positively* coordinated with one just in case the tokens are semantically required to co-refer, and negatively coordinated just in case the tokens are semantically required *not* to co-refer.

The central idea behind the Relationalist approach to substitution failure for simple sentences like those in (6a) and (6b) is that the sentences can semantically differ from one another as a result of differences in the *semantic requirements* on the proper names ‘Clark Kent’ and ‘Superman’. Whereas the tokens of ‘Superman’ in (6a) can be semantically required to co-refer (can be ‘positively coordinated’), the tokens of ‘Clark Kent’ and ‘Superman’ in (6b) *cannot* be.

Importantly, while the tokens of ‘Superman’ in (6a) *can* be positively coordinated, they can also be negatively coordinated. That is, the tokens in (6a) can be positively or negatively coordinated, while those in (6b) can only be negatively coordinated with one another.



The decision to permit the tokens in (6a) to be either positively or negatively coordinated allows Fine to avoid one of the central difficulties for Cumming’s proposal. Recall that Cumming predicts that there cannot be informative occurrences of identities like (18):

(18) O’Leary, the stockbroker, *is* O’Leary, the guy on the train.

The two tokens of ‘O’Leary’ will be cognitively and informationally equivalent to one another, on Cumming’s account, since they belong to the same causal chain, grounded in a single initial baptism.

Fine, on the other hand, predicts that (18) can be informative when the two tokens are negatively coordinated with one other.

Contrary to what the previous examples might suggest, a pair of tokens need not be of the same orthographic type in order to be positively coordinated. An anaphor like ‘himself’ in (19), for example, can (and arguably, *must* – in contrast with a non-reflexive anaphor like ‘him’) be positively coordinated with its antecedent:

(19) Superman admires himself.

According to Fine, ‘himself’ can be positively coordinated with ‘Superman’ despite the orthographic differences between the tokens because it is a *pure semantic fact* the tokens co-refer.¹³⁶

The crucial difference between (19) and (6b) in virtue of which the orthographically distinct tokens in (19) can be positively coordinated with one another, while those in (6b) cannot, turns on Fine’s notion of a ‘pure’ (vs. ‘impure’) semantic fact. A semantic fact is a ‘pure’ semantic fact iff it is one that is “wholly consequential upon the meaning of the expressions which it concerns” (and ‘impure’ otherwise) (2007, 43). For example, while the proposition in (20) is a semantic fact (semantic facts are *propositions*, not sentences) it is not a pure semantic fact because it follows from both the semantic fact, (20a), and the non-semantic fact, (20b).

(20) “Snow is white” is true.

(a) “Snow is white” is true iff snow is white.

(b) snow is white (non-semantic).

By contrast, supposing that (21) is a fact – that (Superman exists and) ‘Superman’ refers to Superman – then it is a pure semantic fact, since the truth of that proposition is wholly consequential on the meaning of the name ‘Superman’ (2007, 43).¹³⁷

¹³⁶ As Elbourne (pc) points out, Fine’s claim that it is a pure semantic fact that ‘Superman’ co-refers with ‘himself’ is rather dubious. The requirement that the reflexive anaphor co-refer with ‘Superman’ descends from a *syntactic* constraint: Condition A of binding theory, which requires that reflexive anaphors co-refer with the closest c-commanding antecedent.

¹³⁷ The claim that the *sentence* (21) is a semantic truth depends on whether we take the truth of a sentence to be consequential on the sentence’s expressing a proposition (since otherwise the status of (21) as a fact may depend – if ‘empty names’ make no semantic contribution – on the existence of Superman). Furthermore, if

(21) “Superman” refers to Superman.

Similarly, the reason that the tokens of ‘Clark Kent’ and ‘Superman’ in (7b) cannot be positively coordinated with one another is that it is only an impure semantic fact that the tokens of ‘Clark Kent’ and ‘Superman’ in (7b) co-refer. The fact that the tokens co-refer is a consequence of the non-semantic fact that the proper names so happen to be assigned to the same referent, independently of one another and not e.g. in virtue of some semantic stipulation that tokens of ‘Clark Kent’ co-refer with tokens of ‘Superman’. By contrast, in the case of (19), it is very plausible that the semantic rules for the reflexive anaphor *require* that it co-refer with its antecedent. The fact that the tokens co-refer is laid down in the semantics – to be thought of, perhaps, as a meaning postulate (Carnap 1947), along the lines of “Bachelor = Unmarried man”.¹³⁸

According to Fine, coordination relations between token proper names determine an extra kind or level of semantic value alongside more familiar *intrinsic* kinds of semantic values (e.g. the referents assigned to proper names and the structured propositions denoted by sentences). These *relational* values take the form of ‘coordination schemes’, equivalence relations that relate the references or denotations of expressions that are semantically required to co-refer. For example, if the two occurrences of the individual Clark Kent that the identity relation in (6a) takes as its arguments are positively coordinated – if the tokens of ‘Clark Kent’ are semantically required to co-refer (on an occasion of use) – then (6a) will be associated with a positive coordination scheme, @+, which places the two occurrences of Clark Kent in the structured proposition expressed by (6a) into

empty names – those that lack reference – make *some* semantic contribution, and ‘Superman’ does not refer, then (21) will express a *false* proposition. Hence the truth of the proposition expressed by (21) will depend on the existence of Superman and (21) will not be a pure semantic fact – a semantic requirement. The claim that (21) is a pure semantic fact thus depends on the assumption that empty names make no semantic contribution.

¹³⁸ This suggests that names of different orthographic types are not, in general, positively coordinated because of the contingent fact that tokens of different types are not (generally) semantically required to co-refer. It is possible, for example, that there should be community in which tokens of “Clark Kent” and tokens of “Superman” descend from the same initial baptism, but where it is convention that the elder member of the community use tokens of one orthographic type and younger members use tokens of the other. In transitioning from one group to another, it seems plausible to say, members do not gain the use of new name but a new way of participating in the use of a name that they already have. If that is the right way to think of this scenario, then there will be positively coordinated occurrences of “Clark Kent is Superman” within the community, e.g. where the first token is uttered a moment before the speaker transitions into membership in the group of ‘elders’ and the second is uttered a moment after.

the same equivalence class. On an occasion on which the pair of occurrences are *negatively* coordinated, there is a negative coordination scheme @-, which places the two occurrences of Clark Kent in *different* equivalence classes.

(6a) Clark Kent is Clark Kent.

(6b) Clark Kent is Superman.

The semantic values of sentences like (6a) and (6b) are identified with coordinated propositions or ‘*c*-propositions’, ordered pairs of coordination schemes and singular propositions. Let *p* be the uncoordinated singular proposition expressed by (6a) on an occasion when the tokens of “Clark Kent” are semantically required to co-refer. The *c*-proposition expressed by (6a) on that occasion is the ordered pair $\langle p, @+ \rangle$, where *p* is paired with the coordination scheme, @+, which positively coordinates the two occurrences of Clark Kent. The *c*-proposition expressed by (6a) on an occasion when the names are semantically required *not* to co-refer is the ordered pair $\langle p, @- \rangle$, where *p* is paired with a coordination scheme, @-, which negatively coordinates the individual occurrences. This *c*-proposition is the same as the *c*-proposition expressed by (6b) on any occasion of use. That is, while there are two different coordination schemes that can be associated with occurrences of (6a), the scheme @+ which positively coordinates the references of the tokens of “Clark Kent”, and the scheme @- which negatively coordinates the references of the tokens of “Clark Kent” (and accordingly two *c*-propositions that occurrences of (6a) can express), there is only one coordination scheme for (6b), the negative coordination scheme which fails to relate the occurrences of Clark Kent to one another (and, accordingly, one *c*-proposition that occurrences of (6b) express).

Like Cumming, Fine claims that the relations linking the references of name tokens (here: coordination relations rather than traditional causal anaphoric relations) can extend beyond sentence and even discourse boundaries. This is said to explain how it is that sentences like (22)-(23) can differ in cognitive significance despite the fact that each contains a single proper name token.

(22) Clark Kent is brave.

(23) Superman is brave.

Since each sentence contains a single name token, any differences that arise in their cognitive significance cannot be the result of different c-propositions defined over the references of names tokens *within* the sentences. Fine's strategy is to appeal instead to differences in the ways that the tokens are coordinated with tokens occurring either in the larger, immediate discourse context or in previous discourse contexts. For example, suppose that, in the larger discourse context, the name 'Clark Kent' has been used to express the proposition that Clark Kent works at the Daily Planet, while the name 'Superman' has been used to express the proposition that Superman flies.

(24) Clark Kent works at the Daily Planet and Superman flies.

According to Fine, an utterance of (22) can carry different information from an utterance of (23), since an utterance of (22) can produce the coordinated sequence of propositions in (25) (where the references of the tokens of 'Clark Kent' in (22) and (24) are positively coordinated), while an utterance of (23) can produce the differently coordinated sequence in (26) (where the references of the tokens of 'Superman' in (23) and (24) are positively coordinated). ('CKS' denotes the individual Clark Kent aka Superman, and underlining indicates positive coordination.)

(25) <CKS, works at the Daily Planet>, <CKS, flies>, <CKS, is brave>

(26) <CKS, works at the Daily Planet >, <CKS, flies>, <CKS, is brave>

Of course, in order to explain the differences in the *informational values* of pairs like (22) and (23), there must be a link between the semantic requirements on the sentences and the information that they can be used to convey. According to Fine, semantic requirements on expressions are 'transparent' to competent speakers in the sense that semantic competence with an expression is a matter of knowing the semantic requirements on that expression. In the case of proper name tokens:

A pair of name tokens are semantically required to co-refer iff sufficiently rational, reflective and semantically competent speakers know (in virtue of their semantic competence) that the tokens co-refer.

For example, a sentence like (6a) will *not* be informative for a semantically competent speaker, since semantic competence requires that the speaker know (or be in a position to know, on reflection) that

the tokens of ‘Superman’ co-refer

(6a) Superman is Superman.

Analogously, (22) and (23) are said to differ in informational value because grasping the content of (22) will require knowing that the individual it represents as being brave is the same one who works at the Daily Planet, while grasping the content of (23) will require knowing that the individual that it represents as being brave is the same one who flies.

According to Fine, relational semantic values, in the form of coordination schemes, do not affect the truth-conditions of simple unembedded sentences like (6a) and (6b) or (22) and (23). The differences between the sentences are solely differences in their informational rather than truth-conditional contents – on the requirements on grasp of the propositions that the sentences express rather than on the truth of those propositions. However, relational semantic values *do*, according to Fine, affect the truth or correctness conditions¹³⁹ of more complex sentences containing operators that are sensitive to relational semantic values. According to Fine, ‘believe’ is such an operator.

Like Cumming, Fine maintains that belief reports like those in (27) and (28) can differ in truth or correctness depending on how the tokens of ‘Clark Kent’ in (28) relate to one another – in particular, on whether the tokens of ‘Clark Kent’ in (28) are positively coordinated, so that (28) is associated with a *positive* coordination scheme, or negatively coordinated, so that (28) is associated with a *negative* coordination scheme. ((27) can only be associated with a negative coordination scheme.)

(27) Lois believes that Clark Kent works at the Daily Planet and that Superman is brave.

(28) Lois believes that Clark Kent works at the Daily Planet and that Clark Kent is brave.¹⁴⁰

¹³⁸It is somewhat peculiar that Fine equivocates on the question whether relational semantic values affect the truth-conditions of belief reports or merely their correctness conditions. Given that relational values are both semantic values and values that operators are able to operate on, it is not clear why they should not be able to contribute in truth-conditionally significant ways. There is no difficulty, of course, making sense of the idea that there are semantically significant contents that do not contribute to the truth (or definedness) conditions of sentences – Kaplan’s characters are a familiar example of contents that have both of these features. However, Kaplan alleges that his characters do not contribute to truth-conditional contents precisely *because* they do not interact with operators; were they to do so, one would naturally expect that they would make a difference to the truth-conditions of reports (broadly construed, so as to include e.g. contributions to definedness conditions).

¹⁴⁰ This presentation of Fine’s account of belief reports is simplified in a number of ways. According to Fine,

In the basic case, if the coordination scheme associated with the report in (28) positively coordinates the pair of tokens of ‘Clark Kent’, (28) will be true iff Lois has *coordinated beliefs* that Clark Kent works at the Daily Planet and is brave. This is a departure from the standard semantics where all that is required is that Lois believe each singular proposition taken on its own; Fine associates this less demanding criterion with (27).

What is it for Lois to have *coordinated* beliefs that Clark Kent works at the Daily Planet and that Clark Kent is brave? According to Fine, it is for Lois’ pair of beliefs to represent Clark Kent ‘as the same’. The notion of two objects being represented ‘as the same’, Fine maintains, is one “that we all have some intuitive grip on” – but it can also be elucidated by a *question raising test*:

[A] good test of when an object is represented as the same is in terms of whether one might sensibly raise the question of whether it is the same. (2007, 40)

At the level of language, a pair of tokens represents their referents *as the same* relative to a discourse only if a semantically competent speaker (“one who understands the discourse”) cannot “sensibly raise the question” whether their referents are the same:

Suppose that you say “Cicero is an orator” and later say “Cicero was honest,”intending to

there are different kinds of requirements that coordinated belief reports can impose on the beliefs of the subjects, corresponding to different readings of belief reports. The most basic and least demanding requirement is associated with what Fine calls the ‘weak de dicto reading’. Fine characterizes the weak de dicto reading as follows:

[On the weak de dicto reading], the names M_i and M_j of the reporter should be coordinated ($1 \leq i < j \leq k$) just in case the corresponding names N_i and N_j of the believer are coordinated. (203)

Fine emphasizes (pc) that this passage articulates a *sufficient* condition for the truth or correctness of the weak de dicto report, but not a necessary one. The weak de dicto reading does not require that the reported subject be able or disposed to *linguistically* characterize his beliefs and their relation to one another (*cf.* the earlier concern about Cumming’s analysis). For example, a report can be true on the weak de dicto reading if the subject is pre-linguistic (a child, perhaps) who has no use of a name or other device of reference that he might use to characterize his beliefs. The kind of interpersonal coordination that weak de dicto reports require is coordination at the level of *belief contents* rather than coordination at the level of the linguistic expression of beliefs, where interpersonal coordination at the level of belief need not be linguistically expressed or expressible.

While the weak de dicto reading is the reading I focus on above, Fine also distinguishes a strict de dicto reading, which requires satisfaction of a stronger ‘cross-coordination’ requirement linking the attributor’s use of a name with the reported subject’s use of that same name.

[On the strict de dicto reading] the *inter*-personal use of the names should be the same. Each of the individual names M_i used by the reporter ($i = 1, 2, \dots, k$) should be coordinated with the corresponding name N_i used by the believer. (103-104)

Apart from a brief discussion to follow (main text), I will not have much to say about Fine’s strict de dicto reading. I do not regard it as clear that there is a strict de dicto reading which is deserving of its own set of truth or correctness conditions, unless correctness conditions come rather cheap. Certainly, a report like “Lois believes that Superman is brave” may in certain cases be *misleading* if Lois does not have a use of the name ‘Superman’, but it is not clear that it is false or even incorrect outside special contexts.

make the very same use of the name “Cicero.” Then anyone who raises the question of whether the reference was the same would thereby betray his lack of understanding of what you meant. (ibid)

Fine also regards the notion of representation *as the same* as having application at the level of belief or thought, where an object of belief is represented as the same across a pair of beliefs or thoughts just in case the intentional subject is unable to sensibly ask whether the objects of her beliefs are in fact the same. This is the sense in which Lois’ beliefs must be positively coordinated with one another in order for (28) to be true on a positively coordinated reading (28) is true iff Lois’ beliefs *that Clark Kent is brave* and *that Clark Kent is a reporter* are positively coordinated with one another in the sense that Lois cannot sensibly raise the question whether her beliefs concern the same individual.

How does this strategy apply to belief reports containing single occurrences of proper names? The strategy here is the same as the one used in the case of pairs of *simple* sentences like (22) and (23), which also contain single occurrences of proper names. Fine distinguishes the pair in (29) and (30) by appealing to coordination relations extending *beyond* individual sentences, across and between discourses.

(29) Lois believes that Clark Kent is brave.

(30) Lois believes that Superman is brave.

For example, suppose that some participant A in the discourse has previously uttered:

(31) Lois believes that Clark Kent works at the Daily Planet,

while a participant B has previously uttered:

(32) Lois believes that Superman leaps tall buildings.

An utterance of (29) can contribute different information from an utterance of (30), according to Fine, since the token of ‘Clark Kent’ in (29) can be coordinated with the token of ‘Clark Kent’ in (31), yielding the coordinated sequence of propositions in (33). By contrast, the token of ‘Superman’ in (30) cannot be coordinated with the token of ‘Clark Kent’ in (31), but can instead be coordinated with the token of ‘Superman’ in (32), yielding the coordinated sequence of propositions in (34). (‘CKS’ denotes the individual Clark Kent aka Superman, and underlining indicates that the names are

coordinated.)

(33) <Lois <<CKS>, *works at the Daily Planet*>, belief>, <Lois, <<CKS>, *is brave*>, belief>

(34) <Lois <<CKS>, *leaps tall buildings*>, belief>, <Lois, <<CKS>, *is brave*>, belief>

There can then be differences in the truth or correctness conditions associated with (29) and (30), according to Fine, because ‘believe’ is sensitive to the (cross-sentential) coordination relations displayed in (33) and (34). For example, (29) will be true or correct on the de dicto reading iff Lois has coordinated beliefs *that CKS works at the Daily Planet and is brave* (in Fine’s terminology: iff Lois represents the object of her pair of beliefs, the guy who works at the Daily Planet and the guy who is brave ‘as the same’), whereas (30) will be true or correct iff Lois has coordinated beliefs *that CKS leaps tall buildings and is brave*. Since Lois does not have the first pair of coordinated beliefs, but does have the second, the pair of reports differ in truth or correctness. (29) is false or incorrect, while (30) is true or correct, as desired.

5.3.2 Problems for Semantic Relationism

According to Soames (2010, *forthcoming*), the main problem with Semantic Relationism’s solution to substitution failure is that it predicts that a report like (29) will express a proposition with the same truth or correctness conditions as the proposition expressed by (30) “[i]n the many discourses in which antecedent assumptions about the agents’ beliefs are *not* part of the shared presuppositions of speaker/hearers” (2010, 470).

(29) Lois believes that Clark Kent is brave.

(30) Lois believes that Superman is brave.

For example, whereas (29) and (30) can be distinguished relative to a discourse context *C* like the one characterized above – which contains (31), (32), and a corresponding pair of presuppositions about Lois’s beliefs which block the inference from (29) to (30) (and conversely) – the Relationist predicts that (29) will express a proposition with the *same* truth or correctness conditions as the proposition expressed by (30) relative to any discourse context *C* which does *not* contain information of the kind

contributed by (31), (32).

Of course, it might seem that the Relationist might then distinguish the reports by appealing to contexts *richer* than *C'*, with *stronger* presuppositions. However, as Soames observes,

...even if acceptable results are achieved in many such contexts, he is still saddled with counter-intuitive results in the poorer ones. What's more, when stronger inference-blocking presuppositions are offered, there may be no guarantee that further inference-reinstating elaborations of [the reported subject's] epistemic situation won't (sometimes) be available. (Soames 2010, 470)

The problem is not that there isn't any way (by Relationist lights) to predict different truth or correctness conditions for (29) and (30) relative to *some* discourse context or other, *C''*, but that Relationism assigns the two reports the same truth or correctness conditions in contexts like *C'*, where there are no inference-blocking presuppositions. However, if there *are* contexts like *C'* where the reports differ in truth or correctness, as Soames suggests that there might be, these contexts will be ones in which truth or correctness conditions of pairs of reports like (29) and (30) *cannot* be captured in Relationist terms.

In a response to Soames, Fine (2010) argues that there *is* a way for the Relationist to distinguish pairs of reports like (29) and (30) in contexts like *C'*, where there are no inference-blocking presuppositions. Relative to *C'*, Fine proposes, (29) and (30) can differ in truth or correctness on the 'strict' de dicto reading, distinct from the 'weak' de dicto reading characterized earlier. According to Fine (2007), the strict de dicto reading requires that...

... the *inter*-personal use of the names should be the same. Each of the individual names M_i used by the reporter ($i = 1, 2, \dots, k$) should be coordinated with the corresponding name N_i used by the believer. (2007, 103-104)

In the case of a report like (29), this 'cross-coordination' or 'inter-personal' coordination requirement requires: (i) that Lois have the use of the name 'Clark Kent' represented by the speaker's token in (29), and (ii) that she be disposed to report *her own* belief by uttering "Clark Kent is brave", making the very same use of 'Clark Kent' as the reporter does (see Fine's 2007, 103-110). As Fine (2010) argues, however, since Lois would *not* characterize her singular belief in the latter way, (29) is false or incorrect on the strict de dicto reading – even in a discourse context *C'*, which does not contain

inference-blocking presuppositions. By contrast, assuming that Lois *would* characterize the content of her belief *that CKS is brave* by uttering, “Superman is brave” in *C*, making the same use of the name ‘Superman’ as the reporter does, (30) is true or correct in *C* – and (29) and (30) have different truth or correctness conditions.

There are several difficulties with Fine’s line of response. First, observe that Soames’ objection to Fine is weaker than it strictly needs to be: Soames assumes that (29) and (30) can be distinguished relative to a context *C* just in case *C* contains an appropriate inference-blocking presupposition. These might or might not be contributed by antecedent reports like (31) and (32) – Soames does not commit on the issue. For all Soames says, these presuppositions could accumulate in a variety of ways and include e.g. propositions presupposed because they are tacitly, non-verbally agreed among participants. Fine, however, *is* committed. According to Fine, a de dicto belief report (weak or strict) is one where ‘believe’ operates on a *c*-proposition composed of an ordered pair of a singular proposition and a coordination scheme (rather than an uncoordinated singular proposition). Accordingly, for de dicto readings of reports like (29) and (30) to arise at all, there must be some coordination scheme @ defined over the references x_1, \dots, x_n of linguistic items i_1, \dots, i_n on the conversational record. However, since de dicto readings arise in relation to *c*-propositions, and *c*-propositions are defined over the references of linguistic items, Fine predicts that belief reports will be sensitive to coordination relations – between propositions in the head of a believer or (the reading Fine focuses on in his reply to Soames) between a reporter and reported subject’s name use(s) – only if and only because there is some corresponding requirement on (coordination relation between) some pair or set of linguistic items.

This is a strong and somewhat surprising prediction. Pre-theoretically, one might expect there to be cases where differences between sentence pairs like the ones we have been considering are generated e.g. by *unarticulated* associations that speakers have with the pair of names – where these pairs are sensitive to information that is not in any way grounded in the conversational record. Indeed, it seems easy to construct cases of precisely this kind. Consider the following scenario:

Insecure Ed suspects that his husband, Peter, has been cheating on him. He hits upon an ingenious idea: He will test Peter by donning a disguise and covertly attempting to woo him. Ed constructs an alter ego, Eduardo, and succeeds in getting Peter to bring him (Ed, in his Eduardo-guise) back to their apartment. However, Ed finds that he is rather enjoying the duplicity, so this goes on for several weeks under the watchful eye of Ed and Peter's neighbor, Mrs. MacDonald, who has also been taken in by Ed(uardo)'s artful disguise. Mrs. MacDonald doesn't know the names of her neighbors, Ed and Peter, and does not know the name associated with Ed's alter-ego (and you and I know this). One Friday night, when Ed is supposed to be away on business, I observe Mrs. MacDonald spying on Eduardo and Peter as they return to the apartment. Here it seems appropriate for me to report:

(35) Mrs. MacDonald believes that Eduardo is spending the night with Peter.

The next morning, Mrs. MacDonald sees Ed arrive at the apartment. Registering her look of concern, I report instead:

(36) Mrs. MacDonald fears that Ed is about to catch Peter red-handed.

Alternately:

(37) Mrs. MacDonald fears that Ed will catch Peter with Eduardo.

Mrs. MacDonald is not in a position to express her beliefs using the embedded sentences, since she has not acquired any of the associated proper names. What instead makes it appropriate for me to report Mrs. MacDonald's Friday-night belief with (35) and her Saturday-morning belief with (36) or (37) is that I know and my audience knows that Mrs. MacDonald's belief that Ed(uardo) is spending the night is coordinated with her beliefs e.g. concerning the dashing young man with the curled moustache or the young visitor to apartment 14R – properties that *we* associate with Ed's alter-ego, 'Eduardo' (aka 'Ed'). Of course, since *we* know that Ed and Eduardo are the same person, there need be no differences in our uses of the names outside these reports. For example, I might report,

(38) I ran into Ed at the deli downstairs...

...without causing you to suppose that Ed was or was not in his 'Eduardo'-guise. Consequently, the case is one where there is no differences in the *history of the name uses* – mine, my audience's, or Mrs.

MacDonald's – and no name use common to the speaker (myself) and the reported subject (Mrs. MacDonald).

5.4 Some final worries for anaphoric theories of proper names

While the usual view is that anaphoric relations between proper names are *extra-semantic* relations of some kind, proponents of anaphoric theories take the unusual step of incorporating these relations into the *semantics* of proper names. In this chapter, I have asked whether this additional step is motivated – whether cases of substitution failure and alleged examples of interactions between names and operators motivate a departure from traditional, non-anaphoric theories of the semantics of proper names.

On the one hand, the kinds of revisions to the semantics that proponents of anaphoric theories propose (dynamic binding, operators on contextual assignment functions and c-propositions, etc.) are non-trivial and should be undertaken only if there are clear descriptive and theoretical benefits to doing so. On the other, it is *not* clear that anaphoric theories offer much benefit over traditional, non-anaphoric theories. Neither Variabilism nor Semantic Relationism seems to provide an adequate account of substitution failure. Moreover, the difficulties encountered by these views suggest, more generally, that the approach anaphoric theories take – explaining substitution failure by adverting to relations between linguistic items – is fundamentally mistaken.

Of course, one might maintain that there are *some* cases of substitution failure that can – or perhaps, are *better* – captured in the way that proponents of anaphoric theories maintain, while other cases of substitution failure arise as a consequence of *purely* intentional factors (e.g. coordination relations at the level of belief that do not have counterparts at the level of language). The difficulty is that whatever (semantic or non-semantic) mechanism we propose to explain cases of the latter sort threatens to carry over to the cases where proponents of anaphoric theories apply their favored mechanism of explanation. As a consequence, it is not clear that anaphoric theories are explanatorily *necessary*, even if there is no purely descriptive problem with their application in particular cases.

The problem of explanatory necessity is compounded by the fact that substitution failure arises in connection with many different kinds of term. Reports like those in (39)-(41) that differ by substitution of co-designative proper nouns or verb phrases can elicit different judgments of truth or correctness in a way analogous to reports which differ by substitution of co-referential proper names.

(39a) Fred believes that Mark is a bachelor.

(39b) Fred believes that Mark is an unmarried man.

(40a) Fred believes that Mark is a lawyer.

(40b) Fred believes that Mark is an attorney.

(41a) Fred bet \$5 that Sam would win.

(41b) Fred wagered \$5 that Sam would win.

Cumming, and, to a lesser extent, Fine, account for substitution failure by adverting to special features of the semantics of proper names. However, it is at least *prima facie* plausible that whatever explains the fact that reports like the pairs in (39)-(41) can elicit different truth-value judgments will carry over to cases like (14) (repeated below), involving proper names.

(14a) Lois believes that Clark Kent is brave.

(14b) Lois believes that Superman is brave.

Here it may seem that Fine's Relationism has an advantage. According to Fine, just as there may be semantic requirements on a pair of name tokens that the tokens co-refer, it may be a semantic requirement that common nouns like 'bachelor' and 'unmarried man' co-designate. However, although there is some plausibility to the idea that it is a semantic requirement on 'bachelor' and 'unmarried man' that they co-designate, since *unmarried man* serves as a definition of 'bachelor', it is less plausible that there are similar requirements on 'accidentally' co-designative nouns – perhaps 'lawyer' and 'attorney', in the example above – neither of which is introduced as an explicit definition of the other.¹⁴¹ At the same time, it is difficult to make the case that examples like (14), (39)-(41) do

¹⁴¹ One reason is that it is implausible that terms like 'lawyer' and 'attorney', 'bet' and 'wager' and 'doctor' and 'physician' (assuming these are all introduced independently of one another) are semantically required to co-designate is the corresponding implausibility of the claim that competence with these terms requires that one

not witness a single phenomenon, whereby, in some contexts, the one report is true and correct if the other is, while, in other contexts, the two reports differ in truth or correctness (for a sample of relevant discussion see Dummett 1973, Burge 1978, Salmon 1989, and Soames 1989c *inter alia*). Since, in at least some of these cases, we will want to say that knowledge of co-reference or co-designation is knowledge of an *extra-semantic* fact, the question is then whether *all* cases of substitution failure should be explained in this way. Put another way, the question is whether there is sufficient evidence of a distinction between the cases where substitution failure is to be explained by ignorance of a *semantic* relation between co-designative expressions and those that are to be explained by ignorance of an *extra-semantic* relation to motivate the anaphoric theorist's strategy in cases of the former kind.

One reason to expect that relational differences (if any) between co-referential names will be extra-semantic in character is that operators do *not* appear to be sensitive to these values. On the one hand, Cumming and Fine do not show that 'believe' is sensitive to the kinds of relational values they appeal to. On the other, name-introducing constructions and cases like (3)-(4) from §5.1 provide rather weak evidence for anaphoric theories. The difficulty with (3)-(4), in particular, is that it is not clear that what we have are interactions between conditional operators and quantifiers, on the one hand, and *proper names*, on the other. Compare (3)-(4) to (42)-(43):

(3) If a child is christened "Goofy", and the CEO of Disney hears about it, he'll sue Goofy's parents. (Geurts 1997, 322)

(4) Every woman who has a husband called 'John' and a lover called 'Gerontius' takes only Gerontius to the Rare Names Convention. (Elbourne 2006, 181)

(42) Everyone who said that they were going to the 'bank' cashed a check or went fishing at the bank.

(43) Everyone who went to a place called 'a bank', said that the bank was crowded.

know that they co-designate. However, on Fine's view, if some pair of expressions is semantically required to co-refer or co-designate, a competent speaker must be in a position to know (in virtue of her semantic competence) that they co-refer or co-designate.

In (42) and (43), it is clear that what are being quantified over are something like semantic types of expression. The denotation of ‘bank’ varies with the values of the antecedent quantifier because the semantic type assigned to the expression varies. This raises the question whether (3)-(4) *also* involve quantification over semantic types rather than assignments of reference to name tokens. It is only if we antecedently assume that proper names are *not* individuated by reference that cases like (3)-(4) can be taken to witness bound occurrences of proper names, where the antecedent quantifier quantifies over assignments of reference to proper name rather than over semantic types in the way illustrated by examples (40)-(41).¹⁴²

In Chapters 2 and 3, I argued that there is abundant evidence that the semantic values of *pronouns* are not exhausted by their assignments of value. This includes evidence (which Kaplan’s semantics cannot capture) that quantifiers and operators interact with the contents contributed by phi-features. Analogously, we might expect that, if there were additional kinds or levels of semantic values associated with proper names (either individually or in pairs), then operators and quantifiers could operate on these values. In contrast with the case of pronouns, however, and contrary to what proponents of anaphoric theories maintain, there is no clear evidence that the truth-conditions of sentences are in any systematic way sensitive to anaphoric relations between names or, correlatively, that proper names interact with operators – that names contribute bindable or shiftable elements. These considerations suggest that proper names do *not* have an anaphoric semantics.

¹⁴² In fact, it is not altogether clear how Cumming’s proposal is meant to explain cases like (3)-(4). According to Cumming, discourse reference determines reference. Thus, in quantifying over assignments of reference to proper names, the antecedent quantifiers in (3)-(4) must be taken to quantify, in the first instance, over discourse referents. If so, then the binding operators in (3)-(4) are not binding the variables corresponding to discourse referents that correspond to individuated uses of names, but something else. A similar problem arises for his proposal that name-introducing constructions involve bound occurrences of proper names.

6 Conclusions

In this dissertation, I considered the prospects and challenges for variable-based models of the semantics of pronouns and proper names.

In Chapters 2 and 3, I argued that Cooper's variable-based semantics for *pronouns* has important empirical and theoretical advantages over competing theories. Chief among these is that it provides a way of resolving an important trilemma for semantic theories of pronouns. On the one hand, it is plausible that referential pronouns have context-independent semantic values. On the other, bound pronouns seem to correspond to bound variables. At the same time, the relation between bound and referential pronouns does not appear to be one of *ambiguity* or *homonymy*. Cooper's semantics shows that these three, independently plausible commitments concerning the semantics of pronouns are not genuinely incompatible with one another. On Cooper's account, pronouns – bound and referential alike – have a variable-based semantics. Their context-independent semantic values correspond to feature-induced semantic presuppositions, which restrict contextual or quantificational assignments to the variables in their logical forms.

Chapter 2 defended Cooper's analysis against arguments that the contents contributed by phi-features have properties that set them apart from standard examples of semantic presuppositions – in virtue of which they are better taken to be pre-semantic contents, conventional implicatures, etc. In response, I argued that the contents contributed by phi-features either *do not* have the properties that allegedly set them apart from semantic presuppositions, or that these properties are not genuinely at odds with a presuppositional analysis. For example, the observation that phi-features play a reference-determining (or restricting) role (and are in this sense, pre-assertoric) is compatible with their analysis as *expressive* presupposition triggers, which contribute at the stage at which content is

determined at a context, rather than at the later stage of evaluation when contents are evaluated for truth or falsity at an index. At the same time, I argued, it is not true that phi-features contribute contents that are *scopally inert*, as it has been standard to maintain. These contents *do* interact with operators in significant ways and are therefore not appropriately taken to be pragmatic contents, pre-semantic contents or ‘scopally inert’ semantic contents like conventional implicatures.

Chapter 3 reinforced the initial observations from Chapter 2 that phi-feature contribute scopally active contents. The main aim of this chapter was to address an important objection to the claim that the relation between bound and referential pronouns is *not* one of ambiguity. This objection centered on four kinds of cases where an apparently bound pronoun ranges over a set of values unrestrictedly – in a way allegedly impossible if its features were interpreted. These cases, according to some authors, show that “there is a ‘puzzle of pronominal ambiguity’, namely, why bound and referential pronouns ‘look the same’ but make fundamentally *different* semantic contributions” (Kratzer 2006, 2; emphasis added).

I argued that there is no puzzle of pronominal ambiguity. In each case, there proved to be an independently motivated way of capturing the allegedly ‘featureless’ (i.e. unrestricted) reading *without* departing from the ‘null hypothesis’ that bound pronouns have interpreted features. By contrast, views on which bound pronouns *lack* interpreted features struggle to account for cases where the features of bound pronouns *do* restrict the values assigned to bound pronouns, and for more global facts concerning the distribution of bound indexical and descriptive pronouns. These considerations strongly suggest that bound and referential pronouns *can* and *must* be given a unified semantic analysis. It is thus an important point in favor of Cooper’s semantics that it successfully accommodates bound and referential pronouns, reconciling the traditional view that anaphoric pronouns correspond to bound variables with the apparent non-homonymy of bound and referential pronouns.

These successes notwithstanding, certain pronoun uses appear to require a departure from the Cooper semantics for pronouns in Chapters 2 and 3 – and, more generally, from the view that

anaphoric pronouns ‘strictly correspond’ to (classical) bound variables. Chapter 4 addressed the phenomenon of *non c-command* or ‘donkey’ *anaphora*. I considered D-type accounts of donkey anaphora and argued that they must be revised in ways that bring the denotations of donkey anaphors closer to those of ordinary bound and referential pronouns. In particular, building on the theory of Elbourne (2001a/b, 2005), I argued that the kinds of mechanisms that appear to be needed in order to derive bishop sentence donkey anaphoric readings can – and arguably must – be applied to ordinary donkey sentences.

In a further, important departure from standard D-type theories, I argued that the model of *definite descriptions* for donkey anaphora cannot be retained, since sentences containing D-type definite descriptions are ambiguous in a way that the original donkey sentences are not. In particular, the model of definite descriptions does not capture the fundamental requirement on the values of donkey anaphors in relation to the values of their antecedents: that their values *covary*. The reason for this is largely the one that Evans (1977a) proposes, namely, that definite descriptions are free to take wide or narrow scope, giving rise to scope ambiguities when interacting with almost all operators. By contrast, donkey anaphors are *anaphors* and, as such, constrained to take on the values of their antecedents. Thus whether a de dicto or de re (wide or narrow scope) reading of some donkey sentence arises depends wholly on the scope taken by the antecedent term.

This pair of considerations suggest that an adequate D-type semantic theory of donkey anaphors must look rather different from standard D-type analyses – in particular, the denotations to donkey anaphora must be more similar to those of bound and referential pronouns and thus closer to those familiar from dynamic theories. At the same time, I suggested that various, more complex bishop sentence cases appear to show that what is needed is a radically revised *D-type* theory rather than a dynamic theory.

Chapter 5 considered how far the model of the variable can be extended – in particular, whether *proper names* should be modeled as variables along with pronouns, as proponents of *anaphoric* theories like Fine and Cumming maintain. Anaphoric theories are a natural outgrowth of two,

independently plausible ideas. The first is that proper names derive their references anaphorically and are thus more similar to variables than either individual constants or definite descriptions. The second is that sentences containing co-designative terms can semantically differ from one another in virtue of structural differences, such as those that arise from differences in anaphoric relations between terms. A natural approach to substitution failure that arises out of this pair of views is to distinguish sentences that differ by substitution of co-referential proper names by assigning relations between proper names *semantic* significance, distinguishing co-referential proper names in terms of the anaphoric relations they enter into. However, Cumming's and Fine's developments of this approach do *not* succeed in accounting for substitution failure phenomena; indeed, the cases we reviewed suggest, more generally, that the approach anaphoric theories take – explaining substitution failure by adverting to (language-level) anaphoric relations between names – is fundamentally mistaken. At the same time, we saw that the evidence that there are semantically significant anaphoric relations between proper names is weak. In particular, there is no clear evidence that the truth-conditions of sentences are in any systematic way sensitive to anaphoric relations between names and far more and far better evidence that proper names *do not* interact with operators than that they do. On balance, the evidence suggests that proper names are *not* anaphors, and do not have a variable-based semantics. While some natural language expressions, like pronouns, correspond to variables, proper names do not.

Bibliography

- Abbott, B. (2001). "Donkey demonstratives", LSA Annual Meeting, Washington DC, January 2001.
- Adger, D. and Harbour, D. (2008). "Why Phi?" In *Phi-theory: Phi-features across modules and interfaces* (pp. 1-34). Oxford & New York: Oxford University Press.
- Anand, P. (2006). *De De Se*. Doctoral dissertation. Massachusetts Institute of Technology.
- Armstrong, D. (1978). *Universals and scientific realism*, Volume I, Nominalism and Realism. Cambridge: Cambridge University Press.
- Atlas, J. (2002). "Presupposition". In L. R. Horn & G. Ward (Eds.), *The handbook of pragmatics* (pp. 29-54). Oxford: Blackwell.
- Bach, E. (1986). "The algebra of events". *Linguistics and Philosophy*. 9: 5-16.
- Bach, K. (1994). Conversational implicature, *Mind and Language*, 9: 124–62.
- Bach, K. (1999). The myth of conventional implicature, *Linguistics and Philosophy*, 22: 327–66.
- Barker, C. (1996): "Presuppositions for Proportional Quantifiers", *Natural Language Semantics* 4: 237-259.
- Barker, C. & C. Shan. (2008). "Donkey anaphora is in-scope binding". *Semantics & Pragmatics* 1: 1–46.
- Barwise, K. J. & Perry, J. (1983) *Situations and Attitudes*. Cambridge: MIT Press
- Beaver, D. (1995). *Presupposition and Assertion in Dynamic Semantics*. Doctoral dissertation, CCS, Edinburgh. Published in 2001 by CSLI Publications, Stanford.
- Beaver, D. (1997). "Presupposition". In Johan van Benthem and Alice ter Meulen, eds., *Handbook of logic and language*, (pp. 939–1008). Amsterdam and Cambridge, MA: Elsevier and MIT Press.
- Beaver, D. and Geurts, B., (2011) "Presupposition", *The Stanford Encyclopedia of Philosophy*, E. Zalta (ed.), <<http://plato.stanford.edu/archives/sum2011/entries/presupposition/>>.
- Berman, S. (1987). "Situation-Based Semantics for Adverbs of Quantification", in J. Blevins and A. Vainikka (eds.), *University of Massachusetts Occasional Papers* Vol. 12, (pp. 45-68). Graduate Linguistic Student Association, University of Massachusetts, Amherst.
- Bhattacharya, S., Sudeshna, S., Choudhur, M., and Basu, A., (2005). "Inflectional Morphological

Synthesis of Bengali Noun, Pronoun and Verb Systems”. Proc. National Conf. on Computer Processing of Bangla (NCCPB 05). Dhaka

Brandom, R. (1994). *Making it Explicit: Reasoning, Representing, and Discursive Commitment*. Cambridge, MA: Harvard.

Braun, D. (2010). "Indexicals", *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/sum2010/entries/indexicals/>>.

Büring, D. (2004). “Crossover situations”. *Natural Language Semantics* 12: 23–62.

Burge, T. (1973). “Reference and proper names”, *Journal of Philosophy*, 70(14): 425–39.

Burge, T. (1978). “Belief and Synonymy”, *Journal of Philosophy* 75: 119-138.

Burton-Roberts, N. (1989): *The limits to debate: a revised theory of semantic presupposition*. Cambridge: Cambridge University Press.

Carnap, R. (1947). *Meaning and Necessity*. University of Chicago Press, Chicago.

Carston, R. (2002), *Thoughts and Utterances: The Pragmatics of Explicit Communication*, Oxford: Blackwell.

Chastain, C. (1975). “Reference and Context”. In K. Gunderson (ed.), *Minnesota Studies in the Philosophy of Science* Vol. 7. *Language, Mind, and Knowledge*, ed. by Keith Gunderson, (pp. 194-269). Morris: U. of Minnesota Press

Chierchia, G. (1984). *Topics in the Syntax and Semantics of Infinitives and Gerunds*. University of Massachusetts, Amherst: Doctoral Dissertation.

Chierchia, G. (1988). “Dynamic Generalized Quantifiers and Donkey Anaphora” in M. Krifka, *Generativity in Natural Language*, (pp. 53-84), Tübingen.

Chierchia, G. (1992). “Anaphora and dynamic binding”. *Linguistics and Philosophy* 15: 111–183.

Chierchia, G. (1995). *Dynamics of Meaning. Anaphora, Presupposition, and the Theory of Grammar*. University of Chicago Press.

Chomsky, N. (1981). *Lectures on Government and Binding*. Foris Publications, Dordrecht.

Cohen, J. and Rickless, S. (2007). “Binding arguments and hidden variables”, *Analysis* 67(1): 65-71.

Cooper, R. (1979). “The Interpretation of Pronouns”, in F. Heny and H. Schnelle (eds.) *Syntax and Semantics* 10: Selections from the Third Groningen Round Table, (pp. 61–92). Academic Press, New York.

Cooper, R. (1983). “Quantification and Syntactic Theory”, *Studies in Linguistics and Philosophy*: Vol 3, Reidel, Dordrecht.

Cumming, S. (2007), *Proper Nouns*. Doctoral dissertation, Rutgers, The State University of New Jersey.

Cumming, S. (2008), “Variabilism”, *Philosophical Review*, 117(4): 525-554.

- Cumming, S. (2009), "Names". *The Stanford Encyclopedia of Philosophy (Fall 2011 Edition)*, Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/fall2011/entries/names/>>.
- Dahl, O. (1975). "On generics", in E.L. Keenan (ed.), *Formal Semantics of Natural Language*. Cambridge: Cambridge University Press.
- Davies, M. (1981), *Meaning, Quantification, Necessity*. London: Routledge and Kegan Paul.
- Davis, W. (2010). "Implicature", *The Stanford Encyclopedia of Philosophy (Winter 2010 Edition)*, Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/archives/win2010/entries/implicature/>>.
- Dekker, P. (2004). "Cases, Adverbs, Situations and Events", *Context Dependence in the Analysis of Linguistic Meaning*, Hans Kamp and Barbara Partee (eds.), Amsterdam: Elsevier, 383–404.
- Dekker, P. (*forthcoming*). *Dynamic semantics*. Available at: home.medewerker.uva.nl/p.j.e.dekker/
- Dekker, P. (2012). "Presupposition". In D. Fara and G. Russell. *Routledge Companion to the Philosophy of Language*. New York: Routledge.
- Dever, J. (1991). *Variables*. Doctoral dissertation, University of California, Berkeley.
- Dimitriadis, A. (2000). *Beyond identity: problems in pronominal and reciprocal anaphora*. PhD thesis, University of Pennsylvania.
- Donnellan, K. (1972). "Proper names and identifying descriptions". In Davidson, D. and Harman, G., editors, *Semantics of Natural Language*, pages 356–379. D. Reidel, Dordrecht.
- Dotlacil, J. and Nilsen, Ø. (*forthcoming*). "A null theory of long-distance reciprocity in English", to appear in NELS 39 Proceedings.
- Dummett, M. (1973), *Frege: Philosophy of Language*. London: Duckworth.
- van Eijck, J. (2006). "Discourse representation theory", *Encyclopedia of Language and Linguistics*, edited by K. Brown, Elsevier 2006, volume 3: 660-669.
- Elbourne, P. D. (2001a), "E-type anaphora as NP deletion", *Natural Language Semantics* 9: 241-288.
- Elbourne, P. D. (2001b), "E-type pronouns as definite articles". In Roger Billerey and Brook Danielle Lillehaugen, eds., WCCFL 19: Proceedings of the 19th West Coast Conference on Formal Linguistics, (pp. 83–96). Somerville, MA: Cascadilla Press.
- Elbourne, P. D. (2005), *Situations and Individuals*. Cambridge, Mass.: MIT Press.
- Elbourne, P. D. (2008a). Demonstratives as individual concepts. *Linguistics and Philosophy*, 31: 409-466.
- Elbourne, P. D. (2008b), "Ellipsis Sites as Definite Descriptions. *Linguistic Inquiry* 39(2): 191-220.
- Elbourne, P. D. (2009). "Bishop Sentences and Donkey Cataphora: A response to Barker and Shan", *Semantics & Pragmatics* 2: 1–7.
- Elbourne, P. D. (2010). "On bishop sentences". *Natural Language Semantics* 18(1): 65–78.

- Evans, G. (1977a). "Pronouns, Quantifiers and Relative Clauses (I)". *Canadian Journal of Philosophy* 7: 467-536.
- Evans, G. (1977b). "Pronouns, Quantifiers and Relative Clauses (II)". *Canadian Journal of Philosophy* 7: 777-797.
- Evans, G. (1980). "Pronouns". *Linguistic Inquiry* 11: 337-362.
- Fiengo, R. and May, R. (1993). *Indices and Identity*. Cambridge, MA: MIT Press.
- Fine, K. (2007). *Semantic Relationism*. Blackwell Publishing.
- Fine, K. (2010). "Comments on Scott Soames' 'Coordination Problems'", *Philosophy and Phenomenological Research* 81: 475-484.
- von Fintel, K. and Heim, I., (2002). *Lecture Notes on Intensional Semantics*. MIT. Available online at URL = web.mit.edu/fintel/www/intens_sem.pdf
- von Fintel, K., (2004a). "Would you believe it? The King of France is back! (Presuppositions and truth-value intuitions.)" In Anne Bezuidenhout and Marga Reimer, (eds.). *Descriptions and beyond: an interdisciplinary collection of essays on definite and indefinite descriptions and other related phenomena*, Oxford University Press, 315-341.
- von Fintel, K. (2004b). "A Minimal Theory of Adverbial Quantification", in H. Kamp & B. Partee, eds., *Context-Dependence in the Analysis of Linguistic Meaning*, Elsevier Ltd, Oxford, 137-175.
- von Fintel, K. (2008) "What is presupposition accommodation, again?" *Philosophical Perspectives*, 22: 137-170.
- Føllesdal, D. (2004). *Referential Opacity and Modal Logic*. New York: Routledge. Reprint of Føllesdal (1966). *Referential Opacity and Modal Logic*. Number 30 in *Filosofiske Problemer*. Oslo: Universitetsforlaget.
- van Fraassen, B. (1968). "Presupposition, implication, and self-reference". *Journal of Philosophy*, 65: 136-151.
- Frege, G. (1892). "Über Sinn und Bedeutung" in *Zeitschrift für Philosophie und philosophische Kritik* 100: 25-50. Translation: "On Sense and Reference" in Geach and Black (1980). *Translations from the Philosophical Writings of Gottlob Frege*, 3rd ed. Blackwell (1st ed. 1952).
- Geach, P.T. (1962). *Reference and generality*, Cornell University Press: New York.
- Geach, P.T. (1969). "Quine's syntactical insights", *Synthese*. 19: 118-129.
- Geach, P. T. (1972). *Logic Matters*, Oxford: Basil Blackwell.
- Glanzberg, M. and Siegel, S. (2004). "Presupposition and Policing in Complex Demonstratives". *Noûs* 40 (1): 1-42.
- Grice, P. (1975). "Logic and conversation", in P. Cole & J. Morgan (ed.), *Syntax and Semantics, 3: Speech*

Acts (pp. 41–58), New York: Academic Press. Reprinted in H. P. Grice (ed.), *Studies in the Way of Words*, (pp. 22–40), Cambridge, MA: Harvard University Press (1989).

Grice, P. (1978). “Further notes on logic and conversation”, in P. Cole (ed.), *Syntax and Semantics, 9: Pragmatics* (pp. 113–28), New York: Academic Press. Reprinted in H. P. Grice (ed.), *Studies in the Way of Words* (pp. 41–57), Cambridge, MA: Harvard University Press (1989).

Grice, P. (1981). “Presupposition and conversational implicature”, in *Radical Pragmatics*, P. Cole (ed.), pp. 183–98, New York: Academic Press. Reprinted in H. P. Grice (ed.), *Studies in the Ways of Words*, pp. 269–282. Cambridge, MA: Harvard University Press (1989).

Grice, P. (1989). *Studies in the Way of Words*, Cambridge, MA: Harvard University Press.

Groenendijk, J. and M. Stokhof. (1991). ‘Dynamic Predicate Logic’, *Linguistics and Philosophy* 14: 39–100.

Guerts, B. (1997). “Good news about the description theory of names.” *Journal of Semantics* 14: 319–348.

Hankamer, J. and Sag, I. (1976). “Deep and Surface Anaphora”, *Linguistic Inquiry* 7, 391–426.

Hardt, D. (1993). *Verb Phrase Ellipsis: Form, Meaning, and Processing*, Doctoral dissertation, University of Pennsylvania.

Hardt, D. (2003). “Sloppy Identity, Binding and Centering”, *SALT XIII*. In Proceedings of SALT XIII, ed. Robert B. Young and Yuping Zhou, 109–126.

Heim, I. (1982). The semantics of definite and indefinite Noun Phrases, Doctoral dissertation, University of Massachusetts, Amherst, Published in 1989 by Garland, New York.

Heim, I. (1990). “E-Type Pronouns and Donkey Anaphora”, *Linguistics and Philosophy* 13: 137–177.

Heim, I. (1991). Artikel und Definitheit. In Arnim von Stechow & Dieter Wunderlich (eds.), *Semantik: Ein internationales Handbuch der zeitgenössischen Forschung*, pp.487—5535. Berlin: de Gruyter.

Heim, I. (1992), “Presupposition projection and the semantics of attitude verbs”, *Journal of Semantics* 9: 183–221.

Heim, I. (1994). “Puzzling reflexive pronouns in de se reports”. Unpublished handout from Bielefeld conference, at semanticsarchive.net.

Heim, I. (1997). “Predicates or formulas? Evidence from VP-ellipsis”. In Aaron Lawon and Eund Cho, (eds), *Proceedings of SALT 7*, pages 197–221. CLC Publications, Ithica, NY.

Heim, I. (1998), “Anaphora and semantic interpretation: A reinterpretation of Reinhart's approach”, SfS-Report-07-93. University of Tübingen.

Heim, I. (2001). “Semantics and morphology of person and logophoricity”. Ms. Tübingen.

Heim, I. (2005a). “Features on bound pronouns: semantics or syntax?”. Ms. MIT.

- Heim, I. (2005b). *Features of pronouns: The semantics of number, gender and person*. (Hand-outs of a series of lectures given at École Normale Supérieure, Paris, France.)
- Heim, I. (2008). "Phi-features on bound pronouns" in *Phi-Theory: Phi-Features Across Modules and Interfaces*, Harbour, D., et al. (eds). 2008. Oxford University Press: *Oxford Studies in Theoretical Linguistics*: 16., pp. 35–56
- Heim, I. & Kratzer, A. (1998). *Semantics in generative grammar*. Oxford: Blackwell.
- Heim, I, H. Lasnik and R. May. (1991). "Reciprocity and plurality." *Linguistic Inquiry* 22: 63-101.
- von Heusinger, K. (1998) *Association with Focus in Definite NPs*. Linguistic Research Center UCSC, LRC-98-O1.
- von Heusinger, K. (1999). *Intonation and Information Structure*. Habilitationsschrift. Universität Konstanz.
- von Heusinger, K. (2007). "Alternative Semantics for Definite NPs". In K. Schwabe and S. Winkler, editors, *Information Structure and the Architecture of Grammar. A Typological Perspective*, pages 485–508. Benjamins, Amsterdam.
- Higginbotham, J., (1983), "Logical Form, Binding, and Nominals." *Linguistic Inquiry* 14, 3 (1983). pp. 395-420.
- Horn, L. (1972). *On the Semantic Properties of Logical Operators in English*, Doctoral dissertation, UCLA
- Horn, L. (1985). "Metalinguistic Negation and Pragmatic Ambiguity". *Language* 61, 121– 174.
- Horn, L. (1996). "Presupposition and Implicature". In: Shalom Lappin (ed.) *The Handbook of Contemporary Semantic Theory*, Oxford: Blackwell. 299–319.
- Hunter, J. (2010). *Presuppositional Indexicals*, Doctoral dissertation, University of Texas at Austin.
- Jackendoff, R. (1968). "Quantifiers in English". *Foundations of Language* 4: 422-442.
- Jackendoff, R. (1971), "On some questionable arguments about quantifiers and negation" *Language*. 47.2. 282- 297
- Jacobson, P. (2000), "Paycheck Pronouns, Bach-Peters Sentences, and Variable-Free Semantics", *Natural Language Semantics* 8: 77–155, 2000
- Jacobson, P. (2008). "Direct Compositionality and Variable Free Semantics: The Case of Antecedent Contained Deletion", in K. Johnson (ed.), *Topics in Ellipsis*. Cambridge University Press. pp. 30-68.
- Jacobson, P. (2012). "Direct Compositionality and 'Uninterpretability': The Case of (Sometimes) 'Uninterpretable' Features on Pronouns", *Journal of Semantics*: 1-39.
- Johnson, K. (2008) *What VP Ellipsis Can Do, and What it Can't, But Not Why*, in *The Handbook of Contemporary Syntactic Theory* (eds M. Baltin and C. Collins), Blackwell Publishers Ltd, Oxford, UK.

- Kadmon, N. (1987). *On unique and non-unique reference and asymmetric quantification*. Doctoral dissertation, University of Massachusetts, Amherst.
- Kadmon, N. (1990), "Uniqueness", *Linguistics and Philosophy*, 13(3): 273-324
- Kamp, H. (1981). "A theory of truth and semantic representation". In: J.A.G. Groenendijk, T.M.V. Janssen, and M.B.J. Stokhof (eds.), *Formal Methods in the Study of Language*. Mathematical Centre Tracts 135, Amsterdam. pp. 277-322.
- Kaplan, D. (1989a). 'Demonstratives', in J. Almog, J. Perry and H. Wettstein (eds.) *Themes from Kaplan*, Oxford: Oxford University Press. pp. 481-564.
- Kaplan, D. (1989b). 'Afterthoughts', in J. Almog, J. Perry and H. Wettstein (eds.), *Themes from Kaplan*, Oxford: Oxford University Press. pp. 565-614.
- Kaplan, D. (1990). "Words", *Proceedings of the Aristotelian Society*, Supplementary Volume, 64: 93–119.
- Karttunen, L., (1976), "Discourse referents". In James D. McCawley (ed.) *Syntax and Semantics 7: Notes from the Linguistic Underground*. Academic Press, New York.
- Karttunen, L. (1973). "Presuppositions of compound sentences". *Linguistic Inquiry* 4: 169–193.
- Karttunen, L. (1974). "Presupposition and Linguistic Context". *Theoretical Linguistics* 1(1): 181–193.
- Karttunen, L. (1976). "Discourse referents". In McCawley, J., editor, *Syntax and Semantics: Notes from the Linguistic Underground*, volume 7, pages 363–386. Academic Press, New York.
- Karttunen, L. and S. Peters. (1979). "Conventional implicatures in Montague Grammar". In Choon-Kyu Oh and David A. Dineen, eds., *Syntax and Semantics 11: Presupposition*, 1–56. New York: Academic Press.
- Keenan, E. (1971). "Names, quantifiers, and the sloppy identity problem". *Papers in Linguistics* 4(2), 211-232.
- Keenan, E., (1976), *Remarkable Subjects in Malagasy*. In C. Li (Ed.), *Subject and Topic* (247-301). New York, NY: Academic Press.
- Kempson, R, W. Meyer-Viol, and D. Gabbay. (1999). "VP ellipsis: Toward a dynamic, structural account." In *Fragments: Studies in ellipsis and gapping*, ed. by Shalom Lappin and Elabbas Benmamoun, 227–289. New York and Oxford: Oxford University Press.
- King, J. (1987), 'Pronouns, Descriptions and the Semantics of Discourse', *Philosophical Studies* 51, 341-363
- King, J. (1993), 'Intentional Identity Generalized', *Journal of Philosophical Logic* 22: 61-93
- King, J. (1994), 'Anaphora and Operators', *Philosophical Perspectives*, 8, Logic and Language (ed.) J. Tomberlin, 221-250.
- King, J. and Stanley, J. (2005). "Semantics, pragmatics, and the role of semantic content". In *Language in context – selected essay*. Oxford: Clarendon Press, 2007 (pp. 133-181).

- Kitagawa, Y. (1991). "Copying identity." *Natural Language and Linguistic Theory* 9: 497–536.
- Kratzer, A. (1989). "An Investigation of the Lumps of Thought", *Linguistics and Philosophy* 12: 607-653.
- Kratzer, A. (1998). "More structural analogies between pronouns and tenses," In D. Strolovitch & A. Lawson (eds.) *Proceedings of SALT VIII*. Ithaca (CLC Publications).
- Kratzer, A. (2006). "Minimal pronouns". ms, at semanticsarchive.net
- Kratzer, A. (2008). "Making a pronoun – fare indexicals as windows into the properties of pronouns". *Linguistic Inquiry* 40(2): 187-237.
- Kripke, S. (1972). *Naming and necessity*. In Davidson, D. and Harman, G., (Eds), *Semantics of Natural Language*, pages 253–355. D. Reidel, Dordrecht. Re-published in (1980), *Naming and Necessity*. Cambridge, Mass: Harvard University Press.
- Kripke, S. (2009). "Presupposition and Anaphora: Remarks on the Formulation of the Projection Problem," *Linguistic Inquiry*, 40: 367-386.
- Landman, F., (1995), "Plurality". In *Handbook of Semantics*, ed. Shalom Lappin. 425-457. Cambridge, MA: Blackwell.
- Landman, F. (2000). *Events and Plurality: The Jerusalem Lectures*. Dordrecht: Kluwer.
- Landman, M. (2006). Variables in natural language. Ph.D. thesis: University of Massachusetts, Amherst.
- Lange, N. (2009). "Presupposition: Lecture Notes". Available online at: <http://www.ling.upenn.edu/~nathanla/ling-590/Presuppositions%20Introduced.pdf>
- Lasnik, H. (1989). *Essays on Anaphora*. Kluwer Academic Publishers.
- Lefebvre, C. (2011). *Creoles, Their Substrates, and Language Typology*. Typological studies in language, Vol 95. John Benjamins Publishing Co.
- Leu, T. (2005)., "Donkey pronouns: void descriptions?", *Proceedings of NELS* 35.
- Link, G. (1983). "The Logical Analysis of Plurals and Mass Terms: A Lattice-Theoretic Approach." In Rainer Bäuerle, Christoph Schwarze and Arnim von Stechow(eds.) *Meaning, Use, and Interpretation of Language*. Berlin: Walter de Gruyter, (pp. 302–323).
- Link, G. (1998). *Algebraic semantics in language and philosophy*. Center for the Study of Language and Information, Stanford
- Loar, B. (1976). "The semantics of singular terms". *Philosophical Studies*, 30: 353–377.
- Lyons, J. (1995). *Linguistic Semantics: An Introduction*. Cambridge: Cambridge University Press.
- Maier, E. (2009). "Proper names and indexicals trigger rigid presuppositions", *Journal of Semantics*. 26, 3: 253-314.

- Martí, L. (2006). “Unarticulated constituents revisited”, *Linguistics and Philosophy* 29: 135-166.
- Matsumoto, Y. (1995). “The conversational condition on Horn scales”. *Linguistics and Philosophy*, 18, 21–60.
- McCawley, J. (1988). *The syntactic phenomena of English*. Vol. 2. The University of Chicago Press.
- Mitchell, J., (1986). *The Formal Semantics of Point of View*, University of Massachusetts at Amherst: PhD dissertation.
- Moltmann, F., (2006): “Unbound anaphoric pronouns: E-type, dynamic, and structured proposition approaches”, *Synthese* 153: 199-260.
- Neale, S. (1990a). *Descriptions*, MIT Press, Cambridge, Ma.
- Neale, S. (1990b). “Descriptive pronouns and donkey anaphora”, *The Journal of Philosophy*. 87, 3, pp. 113–50.
- Nunberg, G. (1993). “Indexicality and Deixis”, *Linguistics and Philosophy* 16, (pp. 1-43).
- Nunberg, G. (1995). “Transfers of meaning”. *Journal of Semantics* 12, 109-132.
- Nunberg, G. (2004) “Descriptive indexicals and indexical descriptions”. In Marga Reimer and Anne Bezuidenhout, (eds), *Descriptions and Beyond*. Oxford University Press, 2004.
- Parsons, T. (1977). “Pronouns as Paraphrases”, ms., University of Massachusetts, Amherst.
- Parsons, T. (1994). “Anaphoric Pronouns in Very Late Medieval Supposition Theory”, *Linguistics and Philosophy*. 17(5): 429-445.
- Partee, B. (1984), “Compositionality,” Landman, F. and F. Veltman (eds.) *Varieties of Formal Semantics*, pp. 281-312. Foris, Dordrecht.
- Partee, B. (1986). “Noun phrase interpretation and type-shifting principles. In *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, eds. J. Groenendijk, D. de Jongh and M. Stokhof, 115-143. Dordrecht: Foris. Reprinted in Portner and Partee, eds., 2002, 357-381. Reprinted in Partee, Barbara H. 2004. *Compositionality in Formal Semantics: Selected Papers by Barbara H. Partee*. Oxford: Blackwell Publishing, 203-230.
- Partee, B. (1989). “Binding Implicit Variables in Quantified Contexts” in *Papers from the Twenty-fifth Regional Meeting of the Chicago Linguistic Society*, Wiltshire et al (eds.), 342–356. Chicago: Chicago Linguistic Society. Reprinted in Partee, Barbara H. 2004. *Compositionality in Formal Semantics: Selected Papers by Barbara H. Partee*. Oxford: Blackwell Publishing, 259-281.
- Partee, B., (2009a). “Lecture 12: Implicit Arguments and Point of View.” Manuscript, University of Massachusetts, Amherst. Available at http://people.umass.edu/partee/720_09/materials/720_09_6.pdf.
- Partee, B., (2009b). “Conventional Implicature”. Lecture Notes. Available online at: URL = http://people.umass.edu/partee/MGU_2009/materials/MGU098_2up.pdf

- Percus, O. (2000). "Constraints on some other variables in syntax". *Natural Language Semantics* 8: 173–229
- Percus, O. (2006). "Antipresuppositions", in A. Ueyama (ed.), *Theoretical and Empirical Studies of Reference and Anaphora: Toward the Establishment of Generative Grammar as an Empirical Science*, (pp. 52–73). Fukuoka, Japan. Report of the Grant-in-Aid for Scientific Research (B), Project No. 15320052, Japan Society for the Promotion of Science.
- Perlmutter, D. (1968). *Deep and Surface Structure Constraints in Syntax*. Doctoral dissertation, MIT.
- Perry, J. (1997). "Indexicals and Demonstratives", In Hale and Wright, ed. *A Companion to the Philosophy of Language*. Blackwell Companions to Philosophy: Blackwell.
- Pollard C., and Sag, I. (1994). *Head Driven Phrase Structure Grammar*. Chicago, IL: University of Chicago Press.
- Postal, P., (1966). "On so-called 'pronouns' in English." In *Modern Studies in English*, ed. David Reibel and Sanford Schane, pp. 201–223. Englewood Cliffs, N.J.: Prentice-Hall.
- Potts, C. (2003). "Conventional implicatures, a distinguished class of meanings". In G. Ramchand & C. Reiss (Eds.), *The oxford handbook of linguistic interfaces*. Oxford and New York: Oxford University Press.
- Potts, C. (2005). *The logic of conventional implicatures*. Oxford and New York: Oxford University Press.
- Potts, C. (2006). "The expressive dimension". *Theoretical Linguistics* 33(2)
- Potts, C. (2007). "Into the conventional-implicature dimension". *Philosophy Compass*, 2: 665-679.
- Quine, W. V. (1979). "Existence and quantification". *Ontological Relativity and Other Essays*, pp. 91-113. New York: University of Columbia Press.
- Recanati, F. (1993): *Direct reference: from language to thought*. Oxford: Blackwell.
- Recanati, F. (1995). "The alleged priority of literal interpretation". *Cognitive Science* 19: 207-232.
- Recanati, F. (2001). "What is said". *Synthese*. 128: 75-91
- Recanati, F. (2004). *Literal meaning*. Cambridge University Press.
- Recanati, F. (2005), "Deixis and Anaphora". In S. Szabo (ed.), *Semantics versus Pragmatics*, New York: Oxford University Press, pp. 286-317.
- Reimer, M. (1998). "Donnellan's Distinction/Kripke's Test", *Analysis* 58, 89-100.
- Reinhart, T. (1976). *The Syntactic Domain of Anaphora*. Doctoral Dissertation. MIT.
- Reinhart, T. (1979), "Syntactic Domains for Semantic Rules", in F. Guenther & S. J. Schmidt, eds., *Formal Semantics and Pragmatics for Natural Languages*, pp. 107–130. Dordrecht: Reidel.
- Reinhart, T. (1983), *Anaphora and Semantic Interpretation*, Chicago: University of Chicago Press.

- Rett, J. (2006). "Context, Compositionality and Calamity." *Mind and Language* 21 (5): 541–552.
- Riester, A. and H. Kamp (2010). "Squiggly issues: Alternative sets, complex DPs, and Intensionality". In T. d. J. Maria Aloni, Harald Bastiaanse and K. Schulz (Eds.), *Logic, Language and Meaning*, pp. 374–383. Revised, Selected Papers from the 17th Amsterdam Colloquium
- Roberts, C. (1989), "Modal subordination and pronominal anaphora in discourse". *Linguistics and Philosophy* 12: 683–721.
- Roberts, C. (1996), "Anaphora in intensional contexts". In Shalom Lappin, ed., *The handbook of contemporary semantic theory*, 215–46. Oxford: Blackwell.
- Roberts, C., (2009), "Names as Definites." Ms., Department of Linguistics, Ohio. State University. (Sells 1985; Roberts 1987, 1989).
- Rooth, M. (1985). *Association with Focus*. Doctoral dissertation, University of Massachusetts, Amherst: GLSA Publications.
- Rooth, M. (1992). "A Theory of Focus Interpretation", *Natural Language Semantics* 1, 75-116.
- Ross, J. R., (1967), 'Constraints on Variables in Syntax'. Doctoral dissertation: MIT
- Rullmann, H. (2003): "Bound-Variable Pronouns and the Semantics of Number" in Agbayani, B., et al (eds.) 2003. *Proceedings of the Western Conference on Linguistics: WECOL 2002*. Department of Linguistics, California State University, Fresno, (pp.243-254).
- Rullmann, H. (2004), "First and second person pronouns as bound variables", *Linguistic Inquiry* 35: 159-168.
- Rullmann, H. (2008), "Each of us must climb our separate mountain." Poster presented at the Annual Meeting of the Canadian Linguistics Association, UBC, May 31-June 2, 2008.
- Safir, K. (2005) "Person, context, and perspective," *Italian Journal of Linguistics*.
- Sag, I., (1976), *Deletion and Logical Form*. Doctoral dissertation: MIT.
- Sag, I. and J. Hankamer. (1984). "Toward a theory of anaphoric processing", *Linguistics and Philosophy* 7: 325–345.
- Salmon, N. (1986). *Frege's Puzzle*. Ridgeview
- Salmon, N. (1989), "Illogical Belief", *Philosophical Perspectives* 3: 243-85.
- Salmon, N. (2010). "Lambda in Sentences with Designators: An Ode to Complex Predication" *Journal of Philosophy*. Vol cvii. no. 9.
- van der Sandt, R. (1988). *Context and Presupposition*. London: Croom Helm.
- van der Sandt, R. (1992). Presupposition Projection as Anaphora Resolution. *Journal of Semantics* 9(4), pp. 333–377.

- Sauerland, U., (2002), “The silent content of bound variable pronouns”, in Kyle Johnson, ed., *Topics in Ellipsis*, Cambridge University Press.
- Sauerland, U. (2003), “A new semantics for number.” In *The Proceedings of SALT 13*, pp. 258–275.. Youn, R.B. and Zhou, Y. (eds). CLC Publications: Ithaca, N.Y.
- Sauerland, U. (2004), “Scalar implicatures in complex sentences.” *Linguistics and Philosophy* 27: 367-391.
- Sauerland, U. (2008a). “Implicated presuppositions”. In A. Steube (Ed.), *Language, context and recognition: The discourse potential of underspecified structures* (pp. 581-600). Berlin and New York: Walter de Gruyter & Co.
- Sauerland, U. (2008b). “On the semantic markedness of phi features”. In D. Harbour, D. Adger, & S. Bejar (Eds.), *Phi-theory: Phi-features across modules and interfaces* (pp. 57-83). Oxford and New York: Oxford University Press.
- Salmon, N. (2006). “Pronouns as Variables”, *Philosophy and Phenomenological Research* 72(3): 656-664.
- Sauerland, U., J. Andersen, and K. Yatsushiro, (2005), “The plural is semantically unmarked’, in S. Kepser and M. Reis (eds.), *Linguistic Evidence – Empirical, Theoretical, and Computational Perspectives*. Mouton d’Gruyter, Berlin, Germany.
- Schlenker, P. (2003a), “A Plea for Monsters”, *Linguistics and Philosophy* 26: 29–120.
- Schlenker, P. (2003b), “Indexicality, Logophoricity, and Plural Pronouns”. *Research in Afroasiatic Grammar II*. Selected papers from the 5th conference on Afroasiatic Languages, Paris, 2000., ed. by Jacqueline Lecarme.
- Schlenker, P. (2004), “Person and binding: A Partial Survey”, *Italian Journal of Linguistics/Rivista di Linguistica*, vol 16, 1: 155-121.
- Schlenker, P. (2006), “Maximize Presupposition and Gricean Reasoning”. Manuscript, UCLA and IJN
- Schlenker, P. (2007), *Lectures notes for Semantics I: Quantifiers and Pronouns, Some Advanced Topics*, UCLA.
- Schlenker, P. (2011). “Quantifiers and Variables: Insights From Sign Language (ASL and LSF). *The Baltic International Yearbook of Cognition, Logic and Communication*, North America, 6, Dec. 2011.
- Schoubye, A., (2011). “Ghosts, Murderers, and the Semantics of Descriptions”, *Nous*: 1-42.
- Schubert, L.K., and F.J Pelletier. (1989). Generically speaking, or, using discourse representation theory to interpret generics. In *Properties, types, and meanings* v. ii, ed. Gennaro Chierchia, Barbara H. Partee, and Raymond Turner, (pp. 193–268). Dordrecht: Kluwer.
- Scott, D. (1970). ‘Advice on Modal Logic’, in K. Lambert (ed.) *Philosophical Problems in Logic. Recent Developments*. Reidel, Dordrecht, 143-173.
- Sellars, W. (1954). “Presupposing”, *Philosophical Review* 63: 197-215.

- Sharvit, Y. (2004). “Free Indirect Discourse and De Re Pronouns”, in R. Young (ed.), *Proceedings of Semantics and Linguistic Theory (SALT) 14*, CLC Publications, Cornell University, 305-322. .
- Simons, M. (2001). “On the conversational basis of some presuppositions”, in R. Hasting, B. Jackson and Z. Zvolensky (eds.), *Proceedings of Semantics and Linguistic Theory 11*, CLC Publications, Cornell University, Ithaca, NY, 431-448.
- Simons, M. (2003). ‘Presupposition and Accommodation: Understanding the Stalnakerian Picture’, *Philosophical Studies* 112: 251-278.
- Soames, S. (1987). “Substitutivity”, in *On Being and Saying: Essays for Richard Cartwright*, J.J. Thomson (Ed), Cambridge: MIT Press, 99-132.
- Soames, S. (1989a). “Presupposition” In Dov Gabbay & Franz Guentner (eds.) *Handbook of Philosophical Logic*, Dordrecht: Kluwer, volume IV, Topics in the Philosophy of Language. 553–616.
- Soames, S. (1989b). “Review of Gareth Evans’s Collected Papers,” *Journal of Philosophy* 3: 141-156.
- Soames, S. (1989c). *Propositions and Attitudes*, Ed. with N. Salmon, Oxford: Oxford University Press.
- Soames, S. (1994). “Attitudes and Anaphora”. *Philosophical Perspectives* 8.
- Soames, S. (2002). *Beyond Rigidity*. Oxford University Press
- Soames, S. (2006). “Descriptive Names vs. Descriptive Anaphora”. *Philosophy and Phenomenological Research*, 72: 665–673.
- Soames, S. (2010), “Coordination Problems”. *Philosophy and Phenomenological Research*, 81: 464–474.
- Soames, S. (forthcoming). “Two Versions of Millianism”, *Reference and Referring: Topics in Philosophy: Vol 10*, MIT Press.
- Sommers, F. (1982). *The Logic of Natural Language*. Oxford: Clarendon Press.
- Speas, M., (1999). “Person and point of view in Navajo”. In *WCCFL 18*
- Sperber, D. and D. Wilson (1986). *Relevance: Communication and Cognition*, Cambridge, MA: Harvard University Press
- Sportiche, D., (1985). “Remarks on crossover”. *Linguistic Inquiry* 16, 460-469
- Stalnaker, R. (1970). “Pragmatics”. *Synthese* 22: 272–289. Reprinted in Donald Davidson and Gilbert Harman, 1972, *Semantics of Natural Language*, Reidel, Dordrecht, pp 272–289.
- Stalnaker, R. (1973), “Presuppositions”, *Journal of Philosophical Logic* 2: 447-457.
- Stalnaker, R. (1974). ‘Pragmatic Presuppositions’, in Munitz, Milton K. and Peter K. Unger (eds.), *Semantics and Philosophy*, New York: New York University Press. Reprinted in Stalnaker 1999.
- Stalnaker, R. (1978). “Assertion”. In Peter Cole (ed.) *Syntax and Semantics 9 – Pragmatics*, New York:

Academic Press. pp. 315–332.

Stalnaker, R. (1984). *Inquiry*, MIT Press, Cambridge, MA.

Stalnaker, R. (1998). ‘On the representation of context’, *Journal of Logic, Language and Information* 7. Reprinted in Stalnaker 1999.

Stalnaker, R. (1999). *Context and Content*, New York: Oxford University Press.

Stalnaker, R. (2002). ‘Common Ground’, *Linguistics and Philosophy* 25(5-6): 701-721.

Stanley, J and Z. Szabo. (2000). “On quantifier domain restriction”. *Mind and Language* 15 (2-3): 219-261. Reprinted in *Language in context – selected essays*. (pp. 69-110). Oxford: Clarendon Press, 2007.

Stanley, J., (2007). *Language in context – selected essays*. Oxford: Clarendon Press.

von Stechow, A. (2002). “Binding by Verbs: Tense, Person and Mood under Attitudes”. In *The Syntax and Semantics of the Left Periphery*, eds. H. Lohnstein and S. Trissler, 44. Berlin: de Gruyter.

von Stechow, A. (2003). “Feature deletion under semantic binding: Tense, Person, and Mood under Verbal Quantifiers”. In *NELS 33*, eds. Makoto Kadowaki and Shigeto Kawahara, 397-403. Amherst Massachusetts: GLSA.

Stockwell, R., P. Schachter and B. Hall Partee. (1973). *The major syntactic structures of English*. New York: Holt, Rinehart and Winston.

Stokke, A. (2011). *Indexicality and Presupposition*. Doctoral dissertation: University of St. Andrews.

Strawson, P. F. (1950). “On referring”. *Mind* 59: 320–344.

Strawson, P. F. (1952). *Introduction to Logical Theory*, London: Methuen.

Strawson, P. F. (1954). “A Reply to Mr. Sellars”, *Philosophical Review*, 63: 216–231.

Strawson, P. F. (1964). “Identifying reference and truth-values”, *Theoria*, 30: 96–118. Reprinted in: *Logico-linguistic Papers*. Methuen, London, 1974, 75–95.

Swanson, E. (2006). *Interactions with Context*. Doctoral dissertation: MIT.

Szabolcsi, A. (2010). *Quantification*. Cambridge University Press.

Tarski, A. (1935). “Der wahrheitsbegriff in den formalisierten sprachen”. *Studia Philosophica, I*: 261-405.

Tomioka, S. (1997). *Focusing effects and NP interpretation in VP ellipsis*. Doctoral dissertation, University of Massachusetts, Amherst.

Tomioka, S. (1999). “A sloppy identity puzzle”, *Natural Language Semantics* 7: 217-241.

Wescoat, M. (1989). ‘Sloppy Readings with Embedded Antecedents’, ms., Stanford University.

Williams, E. (1977). “On deep and surface anaphora”, *Linguistic Inquiry* 8: 692- 696.

Wilson, G. (1984). "Pronouns and Pronominal Descriptions: A New Semantical Category", *Philosophical Studies* 45: 1-30.

Yablo, S. (2006). "Non-catastrophic presupposition failure". In J. Thomson & A. Byrne (Eds.), *Content and modality: Themes from the philosophy of Robert Stalnaker* (pp. 164-190). Oxford and New York: Oxford University Press.

Yagisawa, T. (1984). "Proper Names as Variables". *Synthese* 21: 195-208.

Yanovich, I. (2010). "On the nature and formal analysis of indexical presuppositions", *New Frontiers in Artificial Intelligence*. 272–291.

Zweig, E. (2008). "Dependent Plurals and Plural Meanings", Doctoral dissertation: NYU.